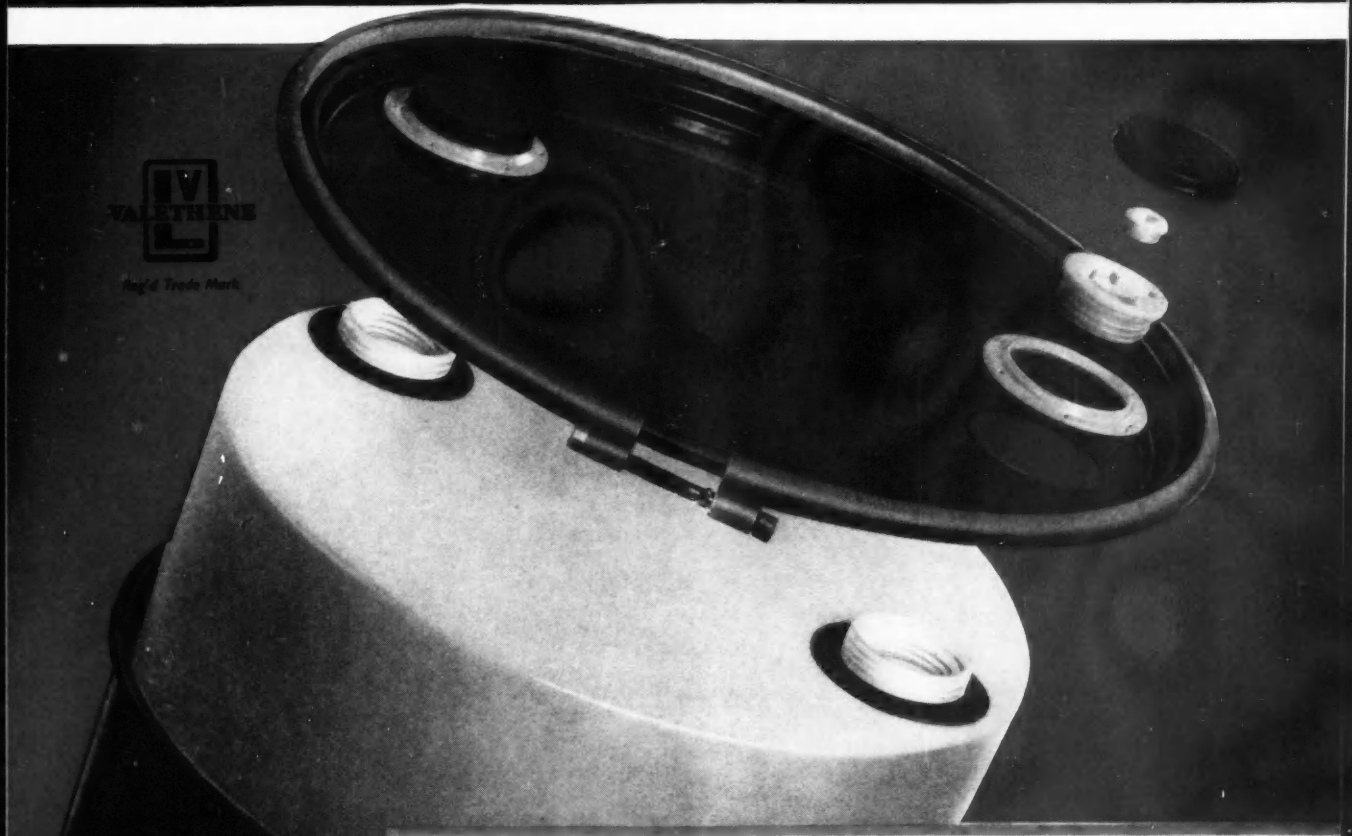
Chemical Age

HALF-WAY STAGE AT NEW ESSO REFINERY
(page 483)

VOL. 82 No. 2100

10 October 1959

THE WEEKLY NEWSPAPER OF THE CHEMICAL INDUSTRY



INDEX TO ADVERTISERS

The first figures refer to advertisements in **Chemical Age Directory & Who's Who,** *the second to the current issue*

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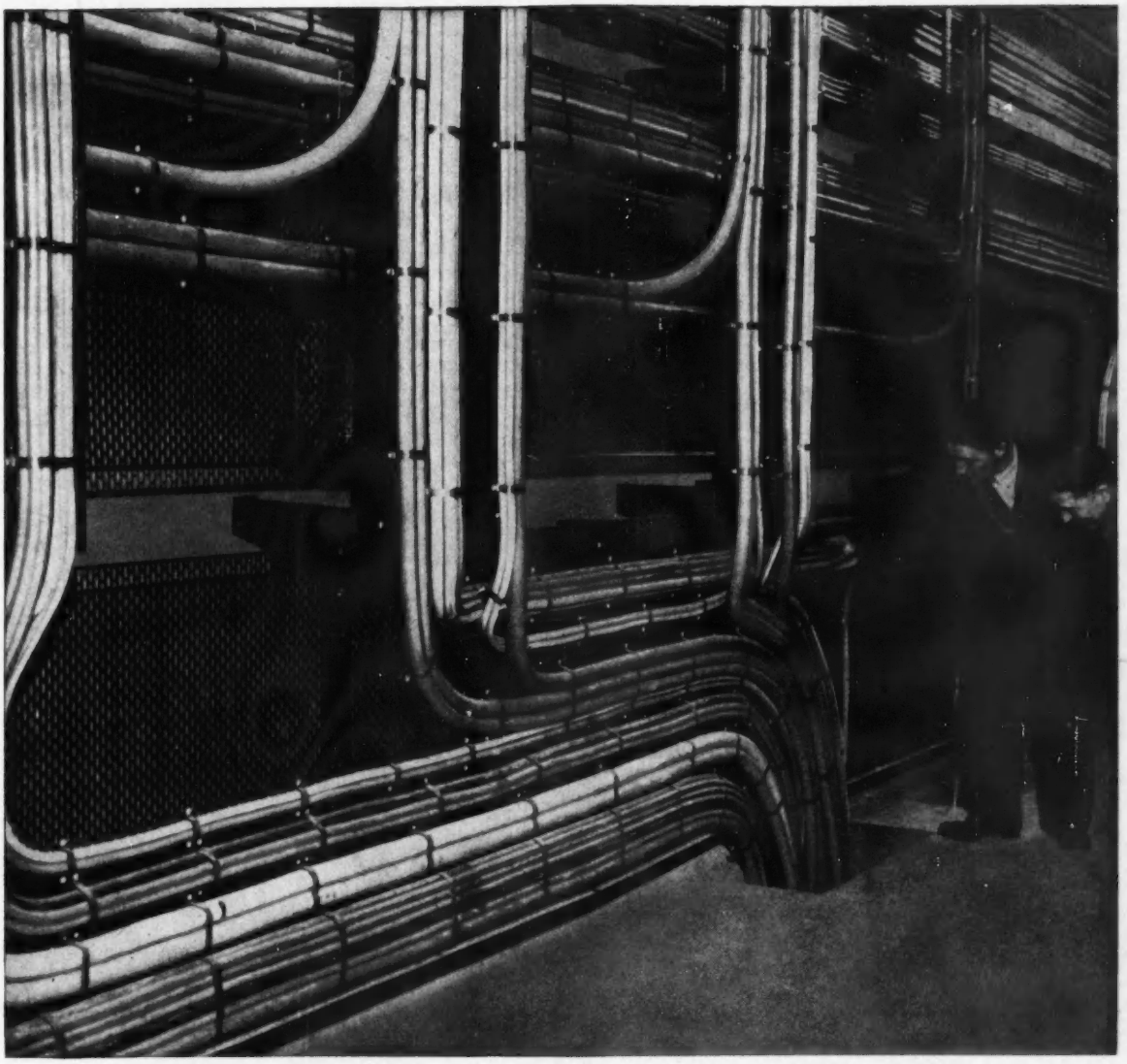

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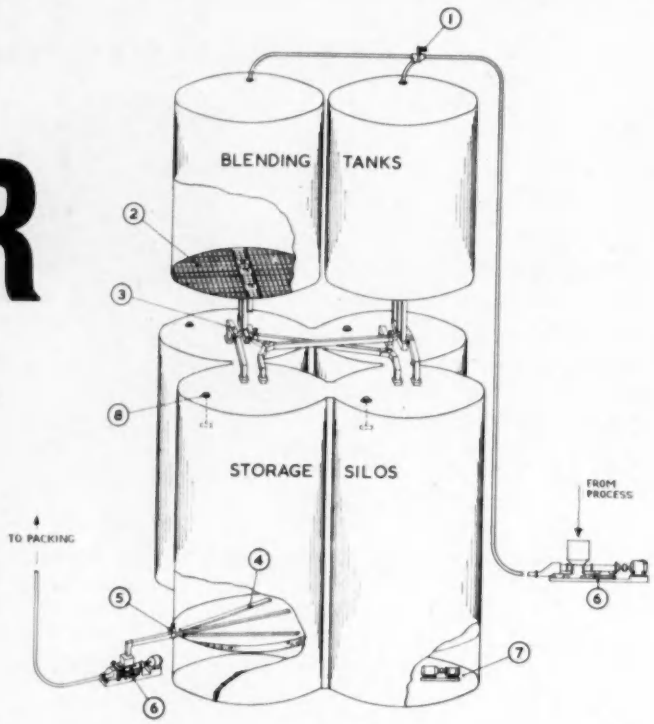

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VOL. 82 No. 2100
OCTOBER 10 1959

Telephone: FLEet Street 3212 (26 lines)
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CHEMICAL AGE

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IN THIS ISSUE

Annual subscription is: home, 52s 6d, overseas, 60s, single copies 1s 6d (by post 1s 9d)

SAFE INSECTICIDES

ILL-INFORMED criticisms have plagued insecticide manufacturers for many years and will doubtless continue to do so as long as chemical methods of pest control are used. Like their closely related contemporaries, the producers of fertilisers, they are regularly criticised on the grounds that their products are slowly poisoning the human race, or that they are eliminating valuable species of insects, or that they are adulterating the nation's food.

Most of these criticisms are ill-informed and frequently represent garbled half-truths or complaints which are given undue importance by being quoted out of context A number of generalisations were made last Sunday by the science correspondent of the *Observer* in his report of a conference held in London last week by the Institute of Biologists. He stated " New pests have appeared, some beneficial species have been decimated and many biologists are beginning to feel that chemical methods of pest control are raising almost as many problems as they solve ".

The report refers to insecticide residues that affect subsequent crops; destruction of bees needed for pollinating crops; lack of legal controls on distribution and use of " these poisons "; and an inference that long-term tests might not always be carried out before a new insecticide comes on the market.

Deaths of bees this year have been attributed to the use of insecticides. In 1958, Australian Department of Agriculture researchers T. Palmer-Jones, *et al.* investigated the effect on honey bees of DDT and Thiodan applied from the air as sprays to marrow stem kale (*N.Z.J. Agric. Res.*, 1959, **2**, 481). Both sprays were applied before bees from nearby apiaries visited crops. Honey bees were repelled by DDT for six days after application, although there was no evidence that it repelled bumble bees. Some mortality occurred in field bees but hives were not weakened. The results showed that DDT emulsion, if applied before bees visit a flowering brassica crop to collect nectar and pollen, will cause only slight mortality. Thiodan exerted no repellency but was more lethal to field bees than DDT. Although no adverse effect on adult bees or brood was observed by the Australian workers, it was considered that hives would have been seriously affected if an area of more than one acre had been sprayed. Hence Thiodan should not be applied to flowering brassica crops.

A U.S. investigation has shown that about the only nectar source available to the bees early in the spring was in weeds blooming in the orchard cover-crops. In many instances insecticides had dripped on to the ground from the trees, causing the loss of the bees. The bees could be protected by the cover-crops being mowed before applying insecticides in the period before blossoming starts. These reports indicate that careful timing for application of spraying of insecticide is important, as is the nature of the surrounding flora.

Insects are probably man's greatest challenge to supremacy on earth. DDT and other synthetic insecticides have been instrumental in saving countless lives, increasing yields and quality of crops; they have saved valuable forests from destruction. It is the haphazard use of insecticides

that arouses concern because of the potential hazard to health, wildlife and fish. Yet it is reassuring to learn that adverse effects on aquatic and wildlife, etc., indicate only minor losses in comparison with the vast quantities used (C. H. Hoffman, *Agricultural Chemicals*, 1959, **14**, No. 8, 41.) Indeed, more often losses attributed to insecticides can be traced to misuse and cleaning of spray equipment, etc., in ponds and streams.

Insecticide manufacturers take every precaution of which they are aware to prevent improper use of their products. Take, for instance, Fisons Pest Control Ltd. (see p. 479); who have included the deliberate addition of a warning colour and taste to arsenical material and print comprehensive safety instructions on containers that conform fully to the statutory requirements for protection of both farm workers and the public.

The arsenites have always presented a real risk, and particularly in a year such as this with the prolonged absence of rain. Fisons have therefore decided to stop the distribution and production of any arsenical weedkiller or defoliant—a decision that may become general policy before long. This is a commendable step that further underlines herbicide and pesticide manufacturers' long-established policy of aiming for safe insecticides.

Before introduction to the market, new insecticides undergo a great deal of experimental work, often over a period of years. Each year the industry spends vast sums on research and development to ensure that a new product will do the job it has been designed for speedily, economically and safely. The danger, if any, is that loose talk about insecticides and their true role might lead to unwarranted restrictions that would greatly limit their effectiveness.

Under a special scheme, the industry voluntarily notifies the Ministry of Agriculture of its investigations and whether a toxic hazard, or increased hazard, is likely to arise with the use of a product. The Ministry aim is to control hazards by voluntary means rather than legislation (CHEMICAL AGE, 1957, 78, 172).

In the constant search for safer chemicals and safer methods of usage, there has been emphasis on the value of biological agents, where they appear useful either alone or in combination with insecticides. Basic studies are in hand on the value of selective chemicals, such as hormones and growth inhibiting substances. Also new ways are being sought to use insecticides in baits with attractants to help cut the amount of toxicant needed.

Advances are being made in the development of systemic preparations and of formulations and material effective against pests, but less toxic to animals. Also promising is Dimethoate, first systemic pesticide to be carried in a tree's 'bloodstream', which is said to be effective against the codling moth. Even more interesting is the use of radioactive isotopes, such as cobalt-60, to sterilise insects.

Profitable lines of approach might also include more co-operation between chemists, entomologists and biologists to determine direct and long term effects of insecticides on humans, wildlife and fishes. Research into spray equipment and formulations designed to cut losses of chemical toxicants might also prove useful.

The widespread 20th century use of chemical methods of pest control has been of incalculable benefit to humanity and is vital if present standards of living are to be maintained and increased. It is heartening to know that the industry is alive to its obligations; it could well make greater use of modern publicity media to tell the general public about its aims, nature of operations, and benefits of insecticides, as well as to point out how hazards are increased by improper use. Much has already been done in this direction in the past year or so, but there is still a long way to go before present misconceptions are overcome.

NEW MICRO-DUMAS APPARATUS

AN analyser which is likely to replace the widely used Kjeldahl apparatus for quality control, is the new micro-Dumas apparatus designed by Grant M. Gustin of Celanese Corporation of America. Salient features are stated to be that it is fast, precise and compact.

Routine analysis can be done at the rate of six an hour, it is claimed. The packed combustion tube containing a 5 mg. sample is attached, the nitrometer adjusted and the cycle switch placed to 'on'. Six minutes later, the nitrogen volume is read. In the six-minute interval the operator is free to weigh more samples.

Standard deviation for the instrument is stated to be 0.04% for nitrogen levels at 10 to 30%, while nitrogen levels as low as 0.01 to 1.0% can be determined. Samples having up to 50% nitrogen are handled in an enlarged nitrometer (5 c.c. capacity compared with 1.5 c.c.).

There are other design departures. The classical glass column for measuring nitrogen gas volumes is replaced by a syringe attached to a suitable counter. This has the advantage that readings are made directly to 0.001 ml. The unit also has a vertical combustion assembly instead of the usual horizontal type so gaining bench space. The complete instrument occupies 1 sq. ft.

Because of the highly skilled techniques required with the older Dumas method, the Kjeldahl has been preferred. The new apparatus, Gustin claims, virtually reduces the method to a semi-skilled operation. Also, the Kjeldahl method depends on simplicity of nitrogen content in the sample. If the nitrogen is contained in a complex manner, the analyst has to know beforehand so that he may revise his procedure. The Dumas method does not require this so that hydrazines, triazoles and other complicated compounds can be handled as easily as simple ones.

Greatest advantage of the Kjeldahl up to now has been the fact that many samples could be run simultaneously, for although a four-hour digestion period is required, followed by a 30-minute analysis, a larger number of analyses could be carried out in a day. According to this Celanese Corporation inventor, however, 40 analyses a day can be done compared with about 20 using the Kjeldahl. Moreover, these can be done consecutively.

As the unit may be linked with a commercial fast-weighing micro-balance, it is believed that quality control and biology groups will use it to replace the Kjeldahl apparatus. Commercial models are expected to be available soon.

SPRAY-DRYING POLYPHOSPHATES

FOR converting disodium phosphate solution into polyphosphate powder, a new technique developed uses a one-stage spray-dryer-calciner. In the conventional process two steps are used. The first makes orthophosphate in a spray (or drum) dryer; this material is then converted to polyphosphate in a rotary kiln.

The new process has been developed by Knapsack-Griesham AG., West Germany, who have a production unit of 120 tons/day capacity. In the U.S., Westvaco division of Food Machinery installed a German-built unit of similar design in 1958.

In the Knapsack plant, a ring-burner is mounted directly on the dryer so that the flame is actually in the dryer shell.

In the conventional phosphate spray dryer, heat is supplied by hot gases from a separate combustion chamber. Phosphate solution is sprayed through the hot flame, which quickly dehydrates it and converts it to the desired product form. By slightly altering operation conditions, the spray dryer can produce either tetrasodium pyrophosphate or sodium tripolyphosphate, or a mixture of the two in any desired ratios. The Knapsack spray-dried product needs no crushing, it is stated.

Fisons to Withdraw Arsenic Crop Spray

FOLIATOX arsenic crop spray produced by Fisons Pest Control Ltd. is to be withdrawn from the market and the company will no longer distribute or produce any arsenical weedkiller or defoliant. This is part of its programme aimed at marketing a range of agricultural chemicals, all of which are safe to man, animal or game.

The spray is a mixture of sodium arsenite and potassium arsenite and has been used to kill the haulm and weeds before lifting potato crops. To minimise hazards, a warning colour and taste have been added to the material and safety instructions have been printed on containers. Despite this, arsenites continue to present a real risk, the company states.

Exemptions from Duty Under Stockholm Plan

UNDER the Stockholm draft plant for a European Free Trade Association of the U.K., Austria, Denmark, Norway, Portugal, Sweden and Switzerland, certain goods will on 1 January 1960 be temporarily exempt from duty on importation into the U.K.

The Board of Trade invite all interested parties who wish to have further information about the reimposition after 1 January 1960 of duties temporarily suspended on that date to write to Tariff Division, Board of Trade, Horse Guards Avenue, London S.W.1. Requests should as far as possible be related to specific goods described in the Import Duties (Temporary Exemptions) (No. 9) Order, 1959.

U.K. Chemical Exports Continue at High Level

EXPORTS have been rising since the beginning of April and chemicals with a rise of 7% in the monthly rate for the period April-August compared with January-March did better than the general average of 5½%. There were increases in most types of chemicals, with the exception of drugs and medicines.

Imports of chemicals were up 9½%.

Comparative figures (monthly averages in thousands of £s) are:

Exports

Year 1958	1st Qtr. 1959	2nd Qtr. 1959	July-Aug. 1959
21,794	22,849	24,568	24,302

Imports

Year 1958	1st Qtr. 1959	2nd Qtr. 1959	July-Aug. 1959
10,011	10,152	10,628	11,845

Record Pharmaceutical Exports

Pharmaceutical exports for the first eight months of this year reached a record of £26.7 million against £25.2 million in the corresponding period in 1958, it was announced at the autumn conference of the Association of British Pharmaceutical industry at Eastbourne.

Announcing these figures, A.B.P.I. president, Mr. E. D. Carey, estimated that on this basis annual pharmaceutical exports would for the first time reach a total of £40 million.

Sir William Garrett is New A.B.C.M. Chairman

NEXT chairman of the Association of British Chemical Manufacturers is Sir William Herbert Garrett, M.B.E., J.P., B.Sc., Ph.D., A.I.C., personnel director, Monsanto Chemicals Ltd. He is also a director of Metal Industries Ltd. Sir William was made a Knight Bachelor in the June 1958 Birthday Honours for his services to industrial relations.

Sir William Garrett

He was elected chairman in succession to Mr. Bernard Hickson (Hickson and Welch Ltd.) at the A.B.C.M. annual meeting held in London on Wednesday this week. Mr. George F. Williams, managing director of British Drug Houses Ltd., was elected president to succeed Sir Walter Worboys.

For 25 years Sir William has been a member of the executive board of the Association of Chemical and Allied Employers. He was appointed vice-chairman in 1943-48, chairman 1948-51, and vice-president in 1957. He is now president of this association. Since 1931 he has been a member of the Chemical Industries Joint Industrial Council and was made president last year of the British Employers Confederation. He is also a member of the National Arbitration Tribunal and a member of the Civil Service Arbitration Tribunal. He was appointed vice-chairman of the A.B.C.M. in 1957.

Educated at Grove Park School, Wrexham, and Liverpool University, Sir William served in the Royal Flying Corps and later, in the Royal Air Force. He joined Monsanto Chemicals in 1922 and was appointed to the board in 1935. His hobbies are horticulture and golf.

Howards to Increase Sorbitol Production

SOLE manufacturers of sorbitol in the U.K., Howards of Ilford Ltd., announce that they have decided to increase their production capacity for this material. A new unit is planned, and it should be on stream in a little over a year. It will give an additional capacity of a 1,000 tons per annum of industrial humectant grade 70% syrup.

Sorbitol is a versatile humectant and has many applications, particularly in the food, cosmetic and paper trades. It is also considered that the material has considerable potentialities as a chemical raw material.

I.C.I.'s Polyester Fibres Agreement with Poland

IMPERIAL Chemical Industries Ltd. have signed an agreement with the Polish foreign trade enterprises, Polimex and Textilimport. The agreement covers the purchase by Polimex of production information and a licence to enable a plant for polyester fibre to be built in Poland, and the purchase by Textilimport of polyester fibre which I.C.I. will supply to Poland during the years 1960-64.

It is expected that the plant producing the Polish polyester fibre, under the name of Elana, will be started up in 1963.

C.J.B.'s H.P. Pipeline Contract from E.M.G.B.

CONTRACT to install a high-pressure pipeline from coke ovens at Scunthorpe, southward to Lincoln and Gainsborough, has been awarded by the East Midlands Gas Board to Constructors John Brown Ltd. The pipeline will be an extension to the North Lincolnshire grid main and will convey additional quantities of coke-oven gas which has become available to works in the south of the country.

Of welded construction, the pipeline will be approximately 50 miles in length and will consist of 12 in. and 8 in. pipe. It will be one of the longest pipelines laid down in the U.K. for some four years.

To protect against corrosion the pipe will be glass-fibre wrapped on site as was the Wales Gas Board's pipeline, also installed by C.J.B. Work on the pipeline will start immediately. Completion is expected in summer 1960.

Tariff Moves Affecting Chemicals

FRANCE has fixed 10,000 tons as the quota for the free entry of certain nitrogenous products until 30 June 1960.

Brazil and Jordan have made alterations in customs tariffs relating to a wide range of goods, including certain chemical products.

Details are given in the *Board of Trade Journal*, 25 September.

★ A NEW, cheaper and more effective flameproof finish will soon be made available to the trade by Proban Ltd. This was stated by Dr. A. F. Childs, head of research for Albright and Wilson, when he recently addressed an audience at the British Rayon Research Association. The new process is understood to be based on cold application instead of hot.

Dr. Childs said that the history of attempts to flameproof cellulose went back about 200 years. The main conclusion from past work was that compounds of boron, phosphorous and the halogens were the most effective as flameproofing agents. The real problem is not flameproofing itself, but to devise a treatment which is fast to washing, does not damage textile properties, is easy to apply and is economic.

A successful treatment, based on amino derivatives of phosphine oxide, has been developed which is satisfactory with regard to wash-fastness. Continuous improvement has been made so far as fabric properties are concerned. The process is, however, moderately expensive and requires careful control in its application. Further developments show considerable easing in conditions of application and some reduction in cost.

★ DETAILS reached me this week of the chemical industry in one of the remoter parts of the world—North Korea. A chemical industry established under Japanese leadership was virtually destroyed during the Korean war; within three years of the restarting of the industry, chemical fertilisers had totalled 193,000 tonnes a year, while sulphuric acid output reached 100,000 tonnes a year.

Work was begun on the erection of an ammonium nitrate plant at the Hynnam fertiliser site and Hungary offered assistance in the building of a dyestuffs plant. A five-year plan, now in hand and due to end in 1961, includes the raising of fertiliser production to 630,000 tonnes a year. A pharmaceutical industry is to be set up, particular attention being paid to the production of medicines.

The plan also covers the production of Vinalon synthetic fibre. Work is also said to have begun on a plant for the production of p.v.c. at an annual rate of 10,000 tonnes.

★ LIQUID hydrogen has usually been considered a very hazardous chemical. Leading to this assumption has been its low ignition-energy requirements when mixed with air, its wide limits of flammability and its known detonation effects under confined conditions. Certainly in the laboratory it has only been handled in small quantities. Now I learn that research workers at Arthur D. Little Inc. (136th A.C.S. national meeting) consider liquid hydrogen to be safer than many other missile fuels.

The A.D. Little group considered a number of potentially dangerous situations and then undertook to find out what actually happens under these conditions. A case in point—gross spillage from a broken storage tank leads hydrogen to combine with air. It was found that the mixture only detonates under rather strong shock; otherwise it burns. Also limits for detonation, even initiated by shock, are approximately from 20 to 50 mol % hydrogen. Since the chance of having both the proper mixture and a strong shock are remote, the likelihood of detonating a mass of hydrogen released by accident is low.

Combustion tests of liquid hydrogen spills show that the danger from this is considerably less than from combustion of propane or other hydrocarbons. The A. D. Little workers suggest therefore that liquid hydrogen storage tanks can be placed much closer together than they now are, provided they are well insulated.

Effect of liquid hydrogen flame radiation on workers in the area has also been found to be less than that for hydrocarbons. For a large spillage a distance of 180 ft. is enough to prevent serious injury under all conditions; safe distance for a similar fire with JP-4 fuel would be 675 ft. Work on the possibility that liquid hydrogen will detonate when it is contaminated with solid air has shown that detonation can occur only when the solid air is considerably enriched with oxygen. Impact sensitivity, however, increases with increasing oxygen content.

★ A MEETING due to be held at the Crewe Arms Hotel, Crewe, at 2 p.m. on 17 October may well be an historic occasion in the world of chemistry, for on that day a new professional body—the Institute of Chemical Technology—may be born. The British Association of Chemists is calling the meeting of chemistry department heads of Technical Colleges that prepare for the Higher National Certificate in chemistry.

I learn from Mr. J. Wilson, B.A.C. president, that the association has been concerned that only about 20% of successful H.N.C. students proceed to associateship of the Royal Institute of Chemistry by examination. The remaining 80%, although numerically an important part of U.K. chemical manpower, are outside any recognised professional body.

The idea is that the new institute would look after the professional interests of those chemists who after reaching H.N.C. level decide to continue their studies in a technological direction rather than along the "more academic lines required by the R.I.C." Admission to associateship would be by H.N.C. in chemistry plus a pass in a technological subject suitable for endorsement on the H.N.C. Admission to fellowship would follow five years later, subject to proof of technological competence.

If the meeting supports the proposal, it will be asked to nominate six people who, with six B.A.C. representatives, would form a private non-profit earning company that would draw up the regulations of the new institute. Both the Ministry of Education and the R.I.C. have been asked to be represented.

★ RECENTLY the Minister of Education, Mr. Geoffrey Lloyd, said that many new colleges of technology were envisaged (CHEMICAL AGE, 26 September, p. 390). At the end of last week, London County Council announced details of new technical colleges costing more than £1.5 million.

The larger sum, over £1 million, will be for a new school of art in Chelsea, and the remainder for a communal building for Chelsea College of Science and Technology. The Barrett Street Technical College on the former John Lewis East Island site near Oxford Circus is to be rebuilt. With accommodation for 650 students, the building will cost £540,000 and a further £50,000 for furniture and equipment. Work on the scheme is expected to start in about a year's time and will be completed in two and a half years.

It seems to me that too long a time is involved in even getting this college started, let alone completed. Also, the sum allocated to science and technology is ludricously small compared with that set aside for the school of art.

★ 'THE Teepol Story' is the title of an article in the July issue of the *P.D. Review*, published by the Powell Duffryn Group. It describes how in the 1930's scientists in the Royal Dutch Shell Amsterdam laboratories discovered a method of synthesising a detergent from petroleum-derived raw materials. Plans for the erection of a large-scale plant were delayed by the war, but a plant did come on stream at Shell's Stanlow refinery in 1942 to make a secondary alkyl sulphate that became known as Teepol.

The plant was the origin of two vast new industries—syndets and petrochemicals. It was the first unit to produce synthetic detergents in the U.K. and the first chemicals-from-petroleum plant. It was later calculated that this single 10,000 tons a year plant saved enough edible oil from soap manufacture to enable an increase in the domestic fat ration of one ounce per head per week for the entire population.

Alembic

M.S. Cold Curing Silicone Rubbers now in Bulk Production

THEIR cold curing silicone rubbers are now being produced on a bulk basis, state Midland Silicones Ltd., 68 Knightsbridge, London S.W.1. The products are now being manufactured to specifications, ensuring greater consistency, and purchasers will be assured of continuity of supply.

The great advantage of these products is that they need no heat cure: the addition of a small quantity of catalyst converts them at room temperature into heat-stable rubbery products. No special equipment or skill is needed. Shrinkage on curing is low.

These rubbers are made in three grades: Cold-Cure Silastomer 9159, the heavy grade which has the consistency of builder's putty and can be moulded, milled or calendered; Cold-Cure Silastomer 9160, the medium grade which can be spread or applied by caulking gun; and Cold-Cure Silastomer 9161, the liquid form suitable for dipping, injection or impregnating.

Future Pattern for Gas Producing Plants

SPEAKING at the annual dinner of the Council of British Manufacturers of Petroleum Equipment at Grosvenor House, London, on 1 October, Dr. James Burns, chief engineer of the North Thames Gas Board, said it was no longer economic to transport raw materials for fuel overground. It was likely that gas plants would be set up on the coalfields and at the great oil receiving centres, the gas being fed into a countrywide distribution system.

Dr. Burns said the first major use of oil as a raw material for gas probably occurred in 1890, when the Gas Light and Coke Co. ordered a very big gasification plant for installation at Beckton to produce the large quantities of gas needed on a cold and foggy day.

The chairman of the council, Mr. G. H. Thorne, said the newly formed British Oil Equipment Credits Ltd. had already signed an agreement with Pemex, the Mexican Petroleum Co., for £3½ million. This was likely to be increased to £7 million and there were other large projects where the credits company might be able to assist.

The Soviet Ambassador, Mr. Malik, and the U.S. Minister of Economic Affairs, Mr. Edwin M. Martin, were among the guests.

James Anderson and C.A. Chemical Plant Survey

The new facility to be commissioned by James Anderson and Co. (Colours) Ltd., Paisley, in mid-1960, represents new research and development laboratories and not an organic pigments plant as stated in our table of new U.K. chemical plant projects on 26 September. Contractor for the project is Angus M. Macdougall and Co. Ltd., and not M. Macdougall and Co. Ltd. as stated.

Why U.S. Market Researchers Get Cool Reception in Europe

SIR,—The comment by Alembic in the 26 September issue of C.A. concerning Mr. Roger Williams' statements on market research in Europe prompts me to write to you.

It is, I think, inevitable that a representative of a U.S. chemical market research organisation should find a considerable reticence on the part of European chemical companies to discuss chemical market intelligence. Market researchers, whether in Europe or elsewhere, rely on an *exchange* of information between one another on which to build their estimates of future potential. Most of the larger chemical companies—and the European industry tends to comprise a limited number of large companies—have their own market researchers engaged full time in accumulating market intelligence and producing market estimates. Contact between these individuals and their opposite numbers in other companies is frequent and in general information to supplement the meagre official statistics is reasonably freely available—if one is in the running!

The representatives of professional market research organisations on the other hand have little to offer in exchange for the detailed information they expect in reply to their questions. They are normally engaged on a specific commission—often for an American company—and they are not at liberty to discuss the results of their findings with anyone other than their clients. For this reason they generally have a cool reception by many European companies.

Difference in U.K.

In the United States a different situation has arisen. In the first place, with very few exceptions, the number of companies engaged in any given sector of the U.S. chemical industry is considerably greater than in Europe. This contributes in no small way to the ability of the U.S. Government to publish detailed statistics without any danger of disclosing individual companies' activities. Also because of the smaller size of some of these companies and the desire to avoid unnecessary duplication of similar work carried out by their competitors, market research consultants are frequently engaged to produce surveys and one such survey may be 'purchased' by several companies with similar interests. In the U.S. market researchers are thus accepted and are therefore given adequate assistance to enable them to carry out their surveys.

I must disagree with Mr. Roger Williams' implication that European market research men produce their estimates of future potential by extrapolation of historical data. This is far from the truth. In fact because of the limited availability and doubtful validity of official statistics we must ensure that our future estimates are based on a sound appraisal of end uses and the growth trends which can be evaluated. Our field work must, of necessity, be more thorough because it is on information so gained that the whole survey is based.

On the question of the soundness and completeness of official statistics I am sure no one will disagree. There is considerable room for improvement—particularly in the U.K.—but if the general principle of avoidance of disclosure of individual organisations' output is to be adhered to, this will continue to mean that statistics on many chemcals cannot be published because of the small number of companies involved.

Yours, etc.,
H. P. HODGE.

Esso Petroleum Co. Ltd.,
Chemicals Department,
London W.1.

LETTERS TO THE EDITOR

Linear Sweep C.R. Polarograph

SIR,—Our attention has been drawn to an account of a Colloquium on Polarography, held in West Germany last year, which appeared on p. 1027 of your issue of 20 December, 1958.

In this article the linear sweep polarograph produced commercially by Southern Instruments Ltd. is incorrectly ascribed to Davies and Reynolds. In fact this instrument was developed wholly by Davis and Seaborn (**1**) and is the subject of U.K. patents (**2, 3**). A complete design was made available to Southern Instruments Ltd. during 1953 as licensees of the National Research Development Corporation.

An anodic attachment for this polarograph was designed by Miss J. E. Seaborn early in 1956 and its use in reverse potential sweep polarography was subsequently described by Davis and Shalgosky (**4**). This work was initiated by a question raised by Dr. W. Furness at a meeting of the Physical Methods Group of the Society for Analytical Chemistry in February, 1956, and its results were communicated privately to Southern Instruments Ltd.

We should be obliged, in view of the misconceptions which may have arisen among polarographers as a result of your article, if you will give this letter suitable prominence.

Yours, etc.,
H. M. DAVIS
J. E. SEABORN
H. I. SHALGOSKY

U.K. Atomic Energy Authority,
Woolwich, London, S.E.18.

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2. Davis, H. M. *U.K. Pat. No.* 702, 685.
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Determining Trace Elements in Foods at Research Association

OPEN day at the British Food Manufacturing Industries Research Association revealed a variety of lines of research and the development of new techniques and apparatus. The following are notes on the work of two sections.

Determination of Trace Elements in Foods. Limits for traces of metals in foods for human consumption have been recommended by the Food Standards

Mr. Paul Cadbury, of Cadbury Brothers Ltd. and a member of the Food Research Association's Council, examining the Food Research Association's vapour phase chromatography apparatus. Mr. J. B. Roberts, of the association staff, who is concerned with this work, is explaining the detail of the apparatus, which is being used to study the flavour of chocolate

Committee of the Ministry of Agriculture, Fisheries and Food (**1**). In the case of arsenic the limits are statutory. According to the 1959 regulations (**2**) the general limit is one part per million, but for certain beverages the limit is 0.1 p.p.m. of elemental arsenic.

The proposed general limit for lead is 2 p.p.m. Lower limits are specified for beverages (0.2 p.p.m.) and refined sugars (0.5 p.p.m.), whereas it is permissible for tea to contain up to 10 p.p.m. of lead. A general limit of 20 p.p.m. is recommended for copper. Among the exceptions are non-alcoholic beverages (2 p.p.m.) and alcoholic beverages (7 p.p.m.). While the general limit recommended for zinc is 50 p.p.m. Exceptions include beverages (5 p.p.m.) and a statutory limit of 100 p.p.m. of zinc in gelatin (**3**).

Routine examination of foods for trace metals imposes a considerable amount of work on the laboratories of food factories. As many of the published methods are time-consuming and require elaborate apparatus, a panel of the British Food Manufacturing Industries Research Association has been formed to survey the literature and carry out collaborative work with the aim of evolving rapid and reliable limit tests. Routine tests are now available to laboratories having the minimum amount of equipment. Exhibits in the analytical department included specific methods for copper and lead, as well as iron, which is not a harmful element but can give rise to spoilage of the colour and flavour of some foods when present even in very small traces.

Glyceride Composition of Cocoa Butter. The physical properties of cocoa butter which make it valuable as a confectionery fat, are due to its relatively simple triglyceride composition compared with that of other natural fats. Its main constituent is 2-oleo-palmitostearin (about 55%) with 2-oleo-distearin (20%) and 2-oleo-dipalmitin (4%), the balance being made up with palmito- and stearo-diolein.

The methods of separation of glyceride fractions used in investigations on lipids such as crystallisation at low temperatures and partition by countercurrent distribution, do not give complete separations and are not very suitable for analytical purposes. In the course of investigations at B.F.M.I.R.A. into methods of analysis of cocoa butter, experiments were made using chromatographic techniques. As a result of these, a complete separation of the mono-unsaturated triglycerides of cocoa butter has been achieved by reverse phase paper chromatography using a non-polar stationary phase with a suitably chosen mobile phase.

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1 Published by H.M. Stationery Office.
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British Plastics Federation Form New Committee

MAIN technical committee of the British Plastics Federation, following a request by members, has recently set up a sub-committee to prepare specifications for expanded polystyrene products. Constitution of the committee has been drawn from materials manufacturers, expanded polystyrene manufacturers and the fabricators of the expanded polystyrene.

The expanded polystyrene sub-committee is considering, in the first instance, a specification for 'expanded polystyrene board for thermal insulation purposes.'

Manesty Machines for N. America

Manesty Machines Ltd., Speke, Liverpool 24, are showing their Rotapress 45 high-speed tablet machine and 300 stainless steel mixer at the Canadian National Packaging Exposition at Toronto from 3-5 November.

At the Chemical Industries Exposition in New York from 30 November to 4 December they will show the Rotapress 55 and the Bi-Cota, a new machine for making a core and applying two coatings in one simultaneous operation.

New Duplex Plating Process by A. & W.

AN addition to the range of metal finishing interests held by Albright and Wilson (Mfg.) Ltd., 1 Knightsbridge Green, London S.W.1, is a duplex plating process.

The new process is a logical development of the company's Plusbrite nickel-plating process, and is designed to give maximum corrosion resistance, together with a fully-bright plate, for such applications as motor car trim and similar automobile accessories.

A new additive is used, Plusbrite S.F., a sulphur-free addition agent which produces an electrolyte giving a semi-bright deposit of high ductility and low internal tensile stress with excellent levelling properties. The deposit has a columnar structure. The standard Plusbrite solution is then used to produce a fully bright finish. As the second deposit is lamellar in structure, a very high standard of corrosion resistance is attained by the duplex process.

Commonsense and the Chemist

CHAIR at a joint meeting of the Microchemistry Group, Society for Analytical Chemistry, the Thames Valley Section, Royal Institute of Chemistry, and the London Section, Society of Chemical Industry, held on 2 October, at Oxford University, was taken by Dr. F. M. Brewer, M.B.E., F.R.I.C.

A paper was presented by Dr. Eric C. Wood, F.R.I.C., Clarence House, 6 Clarence Road, Norwich, entitled 'Quantitative commonsense and the chemist.' He described the statistical approach to investigational problems, with special reference to analytical work.

The importance of knowing the variability of a quantity (preferably in terms of its standard error), as well as its mean value was stressed, and the conditions that must be observed if replicate observations are to give reliable estimates of both were stated and explained. The fundamental principles of experimental design were illustrated by reference to actual analytical procedures. Some fallacies, statistical and otherwise, that the author has encountered in his experience were discussed.

The meeting was preceded by a visit to the Chemistry Division of the Atomic Energy Research Establishment, Harwell.

Imperial College Hall of Residence Opened

WEEKS Hall, the first of several halls of residence to be built for Imperial College in Prince's Gardens, London S.W., was formally opened on 30 September, by Lord Knollys, chairman of Vickers Ltd. The hall, for which Vickers made a benefaction of £150,000 in 1957, is named after Lord Weeks, who was chairman of the company from 1949 to 1956.

After an introductory speech by Sir Patrick Linstead (reactor of the Imperial College), the hall was formally declared open by Lord Knollys.

ESSO REFINERY 50% COMPLETE

£18 m. Project at Milford Haven Due on Stream November 1960

NOW at the half-way stage of construction is Esso Petroleum Co.'s Milford Haven refinery. Work on the 4½ million tons a year (100,000 barrels per stream day) refinery began in July 1958. It is designed to operate on Middle East crude oil and will produce propane, butane, petrols, turbo-jet fuels, autodiesel gas oil and fuel oils. The whole project, which is expected to cost about £18 million, should be on stream in November 1960. The permanent operating force will number about 450 and is being recruited locally as far as possible.

This is the second complete refinery to be built by Esso in Britain since the war. The company's first post-war refinery at Fawley, near Southampton, is now the largest in the British Commonwealth. Main contractors for both projects were Foster Wheeler Ltd.

In setting up the refinery at Milford Haven, great care has been taken to site it so that it is not only a clean, compact place, but that it is also integrated with its surroundings. It will also be the first refinery in Britain to be air-cooled throughout, thus eliminating the need for large quantities of sea-water normally required for cooling, and thereby reducing the dangers of sea pollution by oil.

Process Units

The Pipestill. This 100,000 barrels/day unit will consist of a single-stage atmospheric pipestill together with gas compression stabilisation and naphtha splitting facilities. It is designed to obtain as exact a separation as possible of the large number of liquid hydrocarbons in the crude oil.

Crude oil is heated to a temperature around 750°F, and is fed into the fractionating tower as a mixture of vapour and liquid. The liquid drops to the bottom, and the vapours condense on trays at different levels up the tower.

The furnace of this pipestill is the largest of its kind in the world, with a heat output of about 500 million B.Th.U./hr. The steelwork is erected, and the insulating fire-brick work is partially complete, and work will soon commence on the installation of more than 400 tubes. The 56 oil and gas combination burners are installed in two rows of 28 underneath the furnace.

The reinforced concrete stack, which is lined with fire-brick, will be 300 ft. high to ensure adequate dispersal of flue gases. The shell is complete and almost 50% of the lining is installed.

There will be six towers which will range up to 200 ft. in heights; these are in various stages of completion, with the exception of one which has yet to be delivered. There will be 28 pumps on the unit, more than half of which have been installed with their associated pipework.

There are also 14 Air Fin cooler units. Essentially these consist of tubes with aluminium fins, through which the oil flows, and the fins are cooled by air supplied by four-bladed, 10-ft. diameter propeller type fans, which are electrically driven. These are almost complete but since they will not be required before operation begins they are being 'cocooned' on site as a protection against the weather. This modern method of cooling the product streams supersedes water-cooling, and does away with the handling problems created by having large volumes of water effluent.

Hydrofiner. This unit is an Esso Research and Engineering Co. design and comprises a fixed bed catalytic hydrogen treating process, employing hydrogen from the Powerformer. This process is used for the reduction of the sulphur content of naphthas and diesel oils. The vaporised product is contacted with hydrogen, in the presence of a catalyst, and the sulphur is removed in the form of hydrogen sulphide.

The furnace of this unit is not yet beyond the steel erection stage, although other parts of the unit including the catalytic reactor are well advanced. There are three Air Fin cooler units. These have been completed and are being cocooned. Their design is similar to those on the pipestill.

Powerformer. This unit is also an Esso Research and Engineering Co. designed unit but work has not progressed beyond the foundation stage although much of the equipment is on site.

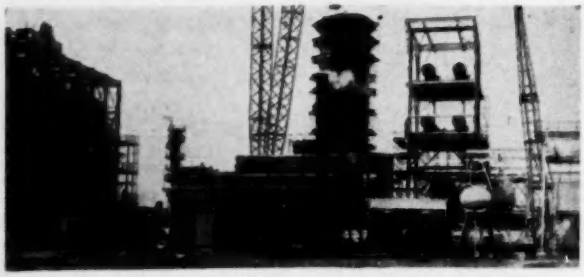
The Powerforming process provides a means for converting a low octane naphtha to a high octane component of premium motor spirit. The naphtha is first hydrofined for the removal of sulphur, and then reformed over a platynum catalyst in an atmosphere of hydrogen at a high pressure.

Aerial view showing progress to date (21 September). More than half the tanks are completed and the refinery units are under erection at right centre

Copper Chloride Sweetening Plant. Light naphtha and turbo-jet fuels from the distillation unit will be treated in this unit for the conversion of corrosive and unpleasant smelling compounds, in order to give a non-corrosive product with a pleasant odour. The vessels, pumps and pipework of this unit are only in an early stage of construction.

Boiler Plant. Two Foster Wheeler boilers each of 130,000 lb./hour at 150 p.s.i.g. and 450°F will be installed to

Top section of the hydrofiner reactor being guided. It weighs 40 tons and is the main vessel of the hydrogen desulphurisation plant



General view of the distillation facilities with the pipestill furnace on left, furnace tubes in the foreground, Air Fin cooler structure and fractionator tower in background

provide steam for process and power requirements. The boilers will be combination gas and oil fired, either separately or proportionally.

Work on the boilers and the associated water treating plant has not progressed beyond the foundation stage, apart from some steel erection for the air compressor facilities and auxiliaries.

The 300 ft. high stack is of the same design as that for the pipestill but is only partially complete.

Control Room. Apart from the boiler house there is only one process control room for the whole refinery. All process operations will be controlled from this point by means of remote controls which are fitted to a graphic panel.

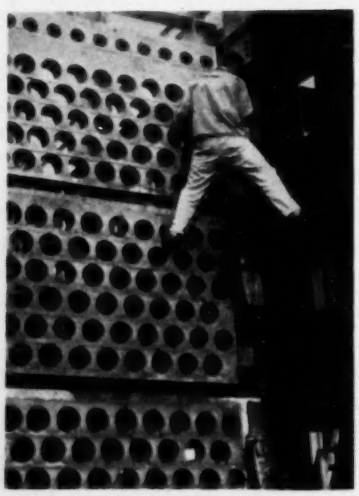
Brickwork of the control room is almost finished but the graphic panel has yet to be installed, although general instrumentation work in the field on valves, transmitters and pipework is proceeding.

Pollution Prevention. First and second line defence against possible pollution of the haven, the skimming pond, consists of a 'reservoir' in a natural ravine with a normal capacity of some 5¼ million imp. gall. and an emergency maximum capacity of 10 million imp. gall. Into this pond will go all refinery surface drainage water and water which has also previously been through the process unit separator to remove entrained oil. To prevent even oil contaminated in a small way the skimming pond will have a dam and a skimmer to remove any oil still present. Clean water will be pumped out through a 48 in. diameter effluent line into the Haven submerged below the low water mark. In an emergency, i.e. a tank failure, all oil will go to the skimming pond to prevent direct drainage to the Haven.

The skimming pond and skimming box are complete. Two 10,000-ton ballast water tanks have been erected into which all tankers coming to the refinery will discharge their ballast water, all of which may be contaminated with oil. After settling, the contents of these tanks will be discharged to oil and water separators.

To deal with any emergency release of gas which cannot be burned at the boilers or furnaces, a multi-jet ground flare is being installed. This is an Esso Research and Engineering design and is smokeless, noiseless and non-luminous.

Besides the main refinery contractors Foster Wheeler Ltd. other principal contractors are Whessoe Ltd., Motherwell Bridge and Engineering Co. Ltd., Wm. Neill and Son (St. Helens) Ltd., and Geo. Wimpey and Co. Ltd. Contractors for the marine terminal are J. Mowlem and Co. Ltd.



Some of the tube hangers in the pipestill furnace

Open Day at Lincolnshire Chemical's New Benzole Refinery

LINCOLNSHIRE Chemical Co. held an open day at their new benzole refinery at Scunthorpe, on Wednesday, 30 September. This refinery, replacing an old one on an adjacent site, incorporates an A.P.V. Ltd. continuous distillation plant in conjunction with batch acid washing. It is designed for maximum production of pure products and has already proved capable of producing 425,000 gallons of nitration benzene a month, a figure in excess of designed capacity. In addition, quality of pure products has been most satisfactory and an indication of this can be gauged from the ease with which pure benzene of C.Pt. 5.4°C can be made (corresponding to 99.8% benzene w/w). Other products produced are solvent and nitration toluene, xylene, solvent naphtha, and indene coumarone fractions.

At a luncheon Mr. H. H. Bates, chairman of Benzole Producers Ltd., referred to the increased national demand for pure benzene, increasing from 5 million gallons in 1949 to approximately 38 million gallons in 1959. Lincolnshire Chemical reported a similar trend, with a production of 60% of crude to pure benzene in 1959 compared to a figure of 5% in 1949, with a corresponding smaller production of motor benzole.

Lincolnshire Chemical also referred to a new venture in conjunction with the Steel Company of Wales in setting up the Port Talbot Chemical Co. Ltd. to treat the coke oven crude benzole available at Port Talbot. This new plant would be the first hydrorefining plant in the country to produce pure benzene.

Amongst those present were representatives of the consumers, crude benzole producers, and contractors and consultants responsible for the new plant.

Progress in B.S.I. Committee Work

AT the annual meeting of the British Standards Institution in London on 30 September, Mr. R. E. Huffam was re-elected for a second term of office as president. Mr. Huffam was, until his recent retirement, U.K. co-ordinating director of Unilever Ltd.

The three deputy presidents were also re-elected. They are: Sir Roger Duncalfe, Sir Herbert Manzoni (City Engineer of Birmingham), Mr. John Ryan (vice-chairman, Metal Box Co. Ltd.).

Members of divisional councils elected to the general council included the following from the Chemical Division—Mr. S. J. Davies (managing director, A. Gallenkamp and Co. Ltd.), Mr. F. Fancutt (assistant director of research, British Railways), and Mr. H. W. S. Wright (Surgical Instruments and Medical Appliances Industry Standards Committee).

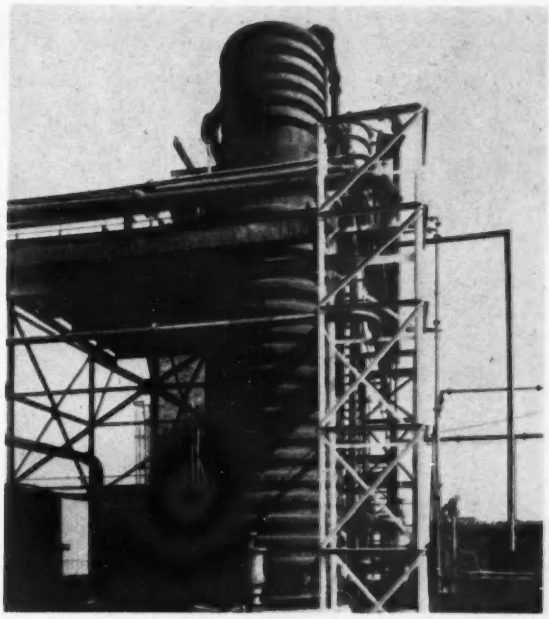
Introducing the annual report Mr. Huffam referred to the 1,000 projects for new or revised British Standards now in hand and spoke of the "tremendous and continuing endeavour" going on all the time in B.S.I.'s 2,800 technical committees. The number of standards departments in firms was increasing.

Mr. Huffam highlighted some of the activities in B.S.I.'s main technical divisions.

On the chemical side, he said, the invention of the new technique of "float" glass had required the amendment of a number of standards. Work was proceeding on standards for food colouring matters and anti-freeze compounds.

N.C.B.'s Murton Coking Plant will Produce 1 Million Gallons of Crude Benzole a Year

£4 m. Plant Built by Woodall-Duckham



Concentrated ammonia liquor plant, liquor still and dissociator. By courtesy of Woodall-Duckham

BUILT as part of the National Coal Board's scheme for a combined mine, washery and coke-producing unit, the £4 million Murton coking plant for N.C.B.'s Durham Division covers, among other aspects, gas-collecting systems, gas cooling, exhausting and tar extraction, intercooling and recirculation, gas purification, water treatment and evaporation. Carbonising capacity of the plant is 1,000 tons of coal a day from which some 250,000 tons of high grade metallurgical coke will be produced yearly. Purified gas will be available at the rate of 7½ million cu. ft. per day, and the by-product plant will produce concentrated ammoniacal liquor tar, and about 1 million gall. of crude benzole annually.

Collecting mains have liquor sprays positioned at every alternate oven and each main is complete with a liquor-sealed bleeder and a pitch trap. Return flushing liquor and the accompanying heavy condensates from the pitch trap return through the suction main and downcomer to the liquor flushing and separating tank. The two pumps delivering the flushing liquor to the ascension pipes and collecting mains, and transferring liquor to the ammonia washers, are of the centrifugal type, one electric and one steam-turbine driven; each has a capacity of 60,000 gall./hour. The liquor flushing and separating tank, which separates the tar before recirculation of the ammonia liquor is of the mechanically-operated scraper type with a 45° slope at the inlet end and a decanting capacity of 34,000 gall. tar from the tank overflows into a 5,000 gall. receiving tank, while the liquor is decanted into a 10,000 gall. tank.

Liquor from the ammonia washers, and hot and cold condensate from the primary coolers and by-products apparatus passes to a three-compartment reinforced concrete sump. The strong liquor compartment has a capacity of 4,500 gall. and the hot and cold condensate compartments a capacity of 3,000 gall. each.

Four steam-driven Duplex-type tar and liquor pumps are located in the central by-product plant, each having a capacity of 6,000 gall. per hour. One serves the hot condensate compartment of the liquor sump, transferring liquor and tar to the liquor flushing tank, a second pump transfers tar from the tar receiver to the two 150,000 gall. capacity tar storage tanks and is also used for tar loading. A third pump delivers liquor from the strong liquor compartment of the liquor sump to a strong liquor storage tank, and the fourth serves as standby.

Primary Coolers. The primary coolers are of the tubular type; two are normally in operation and one is a standby. To cool the gas before it enters the ammonia washers and for naphthalene removal, there is a secondary cooler using petroleum oil as the cooling medium. This cooler is of the hurdle-filled type, elevated on a concrete plinth and is fitted with a mist eliminator and facilities for steaming out. Beneath the cooler, there is an oil decanting tank of 6,000 gall. capacity which receives the drain from the cooler and separates the condensed water from the oil.

Benzole in the vapours vented from the tank is recovered by a vent scrubber fitted with ceramic rings. Cooled gas passes to three Whessoe ammonia washers, operating in series.

The washing medium is normally filtered waste liquor from the concentrated ammonia liquor plant. Provision has been made for the possible introduction of cooled weak fixed liquor as an alternative medium, and soft treated water can be used in the last day of each washer. Provision has also been made for duplication of the washers when the plant is extended

Four floating-head liquid coolers are used to precool the waste liquor before it enters the washers. The arrangement is such that if virgin liquor is to be cooled, two coolers will operate on waste liquor and the other two on virgin liquor. There is provision for the future installation of two further units.

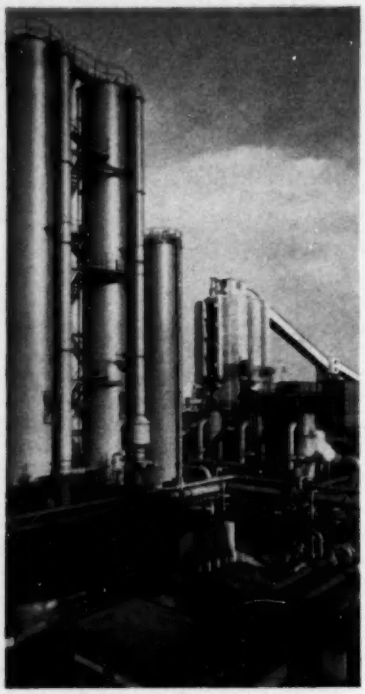
From the ammonia washers the gas passes to the benzole scrubbers.

Benzole Recovery Plant. The benzole recovery plant consists of equipment for the production of crude CS_2 free benzole, and is designed to handle the full gas load after extension of the coke oven batteries. There are two benzole scrubbers, 11 ft 6 in in diameter and 106 ft high, which normally operate in series although each can be by-passed if necessary. Each scrubber has a receiving tank and the second scrubber is provided with an oil separator in the gas outlet line.

Wash oil from the scrubbers, enriched with benzole, is passed through two vapour-to-oil heat exchangers in which heat is transferred from the crude benzole vapour leaving the wash oil still to the cold benzolised wash oil. The condensate is returned to the benzole scrubbers.

Wash Oil Treatment. Enriched wash oil is steam-heated in either of two final heaters before it enters the cast-iron wash oil still. This still, which is 6 ft in diameter and deals with the whole of the wash oil, has a series of fourteen trays where the crude benzole is removed by intimate contact with steam. Working in conjunction with the wash oil still there is a wash oil purifier for conditioning the debenzolised wash oil, the residue being delivered to tank wagons. Hot oil from the still is pumped through a wash oil cooler and collected in a 5,000 gall. capacity tank before recirculation to the scrubbers. The cooler is of the open type with 16 banks of galvanised pipe so arranged that any one bank can be by-passed and steamed out if necessary.

Cooling and Separation. Crude benzole vapour passes from the still through the vapour-to-oil heat exchangers to the crude benzole cooler. This consists of eight banks of galvanised piping in which benzole vapour is water-



By-product plant showing benzole scrubbers and secondary cooler, electro-detarrer and primary coolers

cooled and condensed. From the cooler the crude benzole is passed through a separator to remove the water, and thence into a 300 gall. capacity tank equipped with a liquid level controller acting on a 500 gall./hour motor-driven centrifugal pump delivering to the CS_2 column.

The CS_2 still is of cast iron with 13 stripping sections in the lower portion and 27 rectifying sections above, the whole surmounted by a reflux chamber. In the still which is heated by an external vertical tubular-type heater, CS_2 is removed from the benzole which is then cooled and passed to a 12,000 gall. capacity tank divided into two compartments of equal capacity. CS_2 recovered in the still passes through a floating head type condenser to a decanter from which it flows to a drumming tank of 2,000 gall. capacity equipped with a steam coil.

In the event of a temporary shut-down of the CS_2 still, crude benzole can be returned by suction line from the tank to the still. Crude CS_2 free benzole is stored in two 50,000 gall. capacity storage tanks with facilities for road and rail tank loading.

Concentrated Liquor Plant. This is an automatically controlled plant, designed by R. and J. Dempster Ltd., for the production of crude concentrated ammonia liquor of 25% strength from crude coke oven ammonia liquor which can be dealt with at the rate of 2,500 gall./hour.

Two tanks of 150,000 gall. capacity store coke oven liquor which is brought from the strong liquor compartment of the liquor sump, prior to its delivery to a feed tank of 600 gall. capacity. From this feed tank the liquor is delivered to a preheater by one of two motor-driven, centrifugal, 3,000 gall. per hour capacity feed pumps.

The rack-type preheater is virtually a vapour-to-liquor heat exchanger in which a certain proportion of the crude liquor is preheated before entering the dissociation while at the same time the vapours from the still are partially condensed. The preheater also acts as a dephlegmator from which part of the condensate granulates to the still head as reflux. The preheater consists of 24 concentric tubes which are arranged in two parallel banks of 12, approximately 17 ft. long and connected by headers and return bends. Vapours flow through the inner tubes while the crude liquor passes in counter-current direction through the annuli formed between the inner and outer tubes.

Crude liquor, whether from the preheater or direct from the feed tank is then passed through a liquor dissociator where the specific gravity of the concentrated liquor can be controlled at a predetermined value to avoid crystallisation. The dissociator, 6 ft. in diameter and of cast iron, is equipped with five bubbling trays and a bottom section into which a controlled supply of steam is introduced in order to remove CO_2. This gas is bled off and treated in a fume scrubber before passing to the primary coolers. Beneath the dissociator is the still proper also of cast iron, but 8 ft. in diameter. It is of the loose tray type, with 16 bubbling trays and a bottom section.

Ammonia Stripping

Free ammonia is stripped from the crude liquor and passes as vapour from the stillhead to the preheater previously described. Hot effluent liquor from the base of the still gravitates to a 5,000 gall. capacity sump, from which a proportion is pumped to the ammonia washers, the remainder passing through a natural draught cooling tower to the surplus effluent sump. Cooled effluent from the sump is discharged at a controlled rate into the sewer.

From the preheater partially condensed ammonia vapour, and a proportion of the condensate, pass through the inner tubes of a vapour condenser, in counter-current to a flow of crude liquor through the annuli. This condenser is similar to the preheater but has 18 concentric tubes arranged in two parallel banks of nine.

Water Cooling. Plant for this consists of two independent closed recirculation systems, each complete with cooling tower, cold wells and suction and delivery piping. The cooling towers are of the timber induced-draught type, by Film Cooling Towers Ltd., each comprising two independent cells so arranged that an additional cell can be added to each tower when the plant is extended. The two cells of system A (primary gas coolers, exhauster oil cooler, boosters, after-coolers and air-compressor cooling system) are capable of cooling 55,000 gall. of water/hour to 78°F, while those of system B (secondary gas cooler, ammonia liquor coolers, crude benzole and wash oil coolers and the crude benzole condenser at the CS_2 column) can cool 50,000 gall./hour to 72°.

Gas Purification. To purify the gas before compression and distribution, oxide purifiers of the box-tray type, supplied by R. and J. Dempster Ltd., have been provided. These purifiers consist of five welded steel boxes built as one unit, each box containing 24 trays of oxide in six tiers—the boxes contain 1,250 tons of oxide and have a maximum capacity of 10 million cu. ft./day. Trays of oxide are handled by means of a 25-ton capacity Goliath crane which has an automatic lifting bale. Conventional mobile oxide crushing, disintegrating and conveying equipment is also provided to assist in treatment of the oxide.

Water Treatment. Raw water to the treatment plant originates from the sand feeder reservoir on the site. The plant, which is fully automatic, was installed by John Thompson-Kennicott Ltd., and comprises a line precipitation unit followed by a filter battery from which the water passes to a storage tank. Capacity is 160,000 lb./hr. of water, some 100,000 lb./hr. of which is passed as make-up to the cooling frames and a further quantity when required to other services of the plant. The remainder, which is water for boiler feed purposes, then passes through a base exchange unit with a polystyrene bead resin bed—and on to the storage tank.

Evaporator Plant. Duplicate triple effect evaporator units of Aiton and Co. Ltd., each having a capacity of 25,000 lb./hour, are installed, drawing water from the treated water tank. These units produce distilled water and are designed to operate initially with a live steam supply of 160 p.s.i. at 470°F and ultimately with steam at 600 p.s.i. at 800°F. This provision was made so that the turbine throughput would initially include the evaporator steam which would thus lead the turbine during the early days when steam consumption figures are not such as to give the full load requirements of the turbo alternator.

Main Contractors: Woodall-Duckham Construction Co. Ltd.

Main sub-contractors and suppliers included: Newton Chambers and Co. Ltd., gasholder; R. and J. Dempster, Ltd., C.A.L. plant; Whessoe Ltd., electro-detarrers and ammonia washers; Belliss and Morcom, Ltd., gas boosters; Richardsons Westgarth (Hartlepool) Ltd., gas exhausters; Visco Engineering Co. Ltd., timber quenching tower, and heating and ventilating plant; Film Cooling Towers (1925) Ltd., cooling tower; Foxboro-Yoxall Ltd., central control panel; Metropolitan-Vickers Electrical Co. Ltd., and General Electric Co. Ltd., electric motors; Joseph Evans and Sons (Wolverhampton) Ltd., pumps; and W. H. Smith and Partners Electrical Engineers Ltd., electrical installation.

Technical Courses in London

Subjects for courses at the Sir John Cass College, Jewry Street, London E.C.3, in the coming session include radiochemistry and radioactivity, radioactive isotopes in metallurgy and ceramics, the modern kinetic theory of liquids, spectrochemical analysis, absorption spectroscopy, fundamentals of microbiology and applied microbiology.

B.D.H.'s New Cyanide Test and Anti-bumping Granules

TWO new tests using the B.D.H. Lombard Nessleriser are now available, British Drug Houses Ltd. (B.D.H. Laboratory Chemicals Division, Poole) report.

For determination of cyanide Disc NOC has been developed providing nine standards for concentrations of cyanide (as CN) from 0.02 to 0.2 p.p.m. The method (pyridine-pyrazolone reagent) is based on that of Epstein (*Anal. Chem.* 1947, **19,** 272) and the official cyanide test of the American Public Health Association (*Standard Methods for the Examination of Water Sewage and Industrial Wastes,* 10th Ed., 1955, p. 299). The disc replaces Disc NZ based on a method using benzidine, which is now withdrawn.

The second test is for determination of formaldehyde. Disc NOD provides colour standards corresponding to 1 to 10 micrograms (in nine steps) of formaldehyde. The method employs the violet-red coloration developed by formaldehyde on warming with chromatropic acid in concentrated sulphuric acid (Ecgrine, E., *Z. Anal. Chem.,* 1937, **110,** 22 and Feigh. F., *Spot Tests*).

Now available from B.D.H. are anti-bumping granules. These small granules of fused aluminium oxide have proved considerably more effective than broken porous pot in preventing bumping of liquids that are being evaporated or distilled, and where reaction mixtures are being refluxed. They have the advantage, it is claimed, of resuming their 'anti-bumping' function after temporary close down and only small quantities need be used.

An intermediate of some interest, 3-chloro-propan-1-ol (trimethylene chlorhydrin) has been prepared by B.D.H. Trimethylene oxide is formed when it is heated with solid potassium hydroxide and 3-chloro-propionic acid when it is added gradually to concentrated nitric acid. It can be used in the preparation of 3-chloro-propyl alkyl and aryloxyalkyl sulphites, said to be useful as insecticides. 3-Chloro-propan-1-ol is also said to inhibit deterioration when sprayed on cottonseed, flaxseed, sunflower seed, rice and grain before storage.

Other additions to B.D.H. Laboratory chemicals range are: 2:2-dimethyl-propan-1-ol, the less common isomer of amyl alcohols; maleic hydrazide, suggested as an inhibitor of plant growth; and trichloro-acetic acid for protein precipitation in a specially purified grade (containing less than 0.0001% iron (Fe) and less than 0.0005% sulphate) suitable for estimation of serum iron.

Recent EDTA Applications Discussed at Midlands S.A.C. Meeting

SOME applications of EDTA were discussed at a meeting of the Midlands Section of the Society for Analytical Chemistry at the University, Birmingham, the discussion being opened by Dr. T. S. West (Birmingham University), Mr. J. Blenkin and Mr. C. A. Johnson (Boots).

Dr. West discussed recent advances in the technique of complexometric analysis. The subject matter ranged over new complexones, indicators, methods of physico-chemical end-point detection, masking procedures, etc. Recent trends were examined and some comments made on possible developments in the near future.

Mr. Blenkin gave a brief description of the development of some methods incorporating EDTA titrimetry for the analysis of the ash from compounded rubber.

These methods had particular reference to:—

(a) The determination of barium sulphate by solution in ammonium EDTA after pre-treatment of the sulphate.

(b) The determination of strontium in the presence of zinc, using differential pH techniques and ion-exchange resins.

(c) The determination of iron, aluminium and magnesium in silicates after fusion in sodium hydroxide.

Mr. Johnson said that during the past few years EDTA had been used increasingly for routine analytical control in the pharmaceutical industry. Some of the types of problem occurring in this field were reviewed and a somewhat more detailed account was given of the analysis for aluminium. The use of complexometric methods for the determination of alkaloids and of sulphate were considered. Finally some attempt was made to assess the contribution which EDTA had so far made to routine control analysis.

Third Annual Meeting of Scientific Societies in South Wales

Third annual meeting of Scientific Societies in South Wales and Monmouthshire will be addressed this year by Sir Harry Melville, F.R.S., whose subject will be 'Research and Development in the D.S.I.R. Stations'. It is again being held in the Reardon-Smith Lecture Theatre, National Museum of Wales, Cardiff, and will commence at 6.45 p.m. on Friday, 13 November. Admission will be by ticket only. Tickets are obtainable from secretaries of local sections of the respective scientific societies or from secretary, Co-ordinating Committee, Dr. R. Rawlings, University College, Newport Road, Cardiff.

Jason Research Reactor in Operation

JASON, Hawker Siddley Nuclear Power Co.'s 10 kW research reactor, came into operation on 1 October. The £55,000 reactor is stated to be by far the cheapest reactor at present available in Europe and is fuelled with 9-12 lb. of enriched uranium. It burns less than 1 gm. of fuel a year.

First contract for the sale of a Jason in the U.K. is expected to be announced shortly. The reactors are to be sold to U.K. and European Universities, technical colleges, medical and agricultural research centres and similar institutions.

In this reactor, uranium fuel is cooled and moderated by specially purified water which is enclosed in a tank surrounded by large graphite blocks.

The aluminium-clad fuel elements used in the reactor are readily available, since they are similar to those used in the U.K. Atomic Energy Authority's Dido and Pluto reactors.

George Kent International Conference

A FOUR-DAY conference was held by George Kent Ltd., at Luton in the week beginning 28 September. From the introductory to the closing session, both of which were under the chairmanship of Commander P. W. Kent, R.N., there was a heavy programme of discussions projected for the freest expression and examination of views on all technical and marketing matters. These discussions were preceded by a review of company policy; also dealt with were future plans in relation to the company's whole range of industrial instruments, meters and automatic controllers in the home and export markets.

Attending the conference were members of the Kent sales organisation from many parts of the world, in addition to U.K. area representatives, directors and senior engineers.

Chemistry Lectures in Manchester Area

Post-advanced lectures in chemistry in the Manchester areea are listed in a booklet issued by the Manchester and District Advisory Council for Further Education. These are lectures in specialised branches of chemistry, the policy of the committee being not to concern itself with normal university and technical college courses.

A Future for Coal

As a source of raw materials as opposed to a source of power, coal is still only at the beginning of its potential career. This was stated by Sir Miles Thomas, chairman of Monsanto Chemicals Ltd., and the British Productivity Council in an address to the Coal Industry Society in London on Monday. He emphasised that money and effort must be spent by the National Coal Board, by the tar distillers, by the chemical industry and by Government sponsored research organisations to expand the uses of coal.

Australia Rejects Sulphuric Acid Recommendations, Calls For New Tariff Enquiry

TARIFF board recommendations designed to raise sulphuric acid production in Australia from local resources have been rejected by the Commonwealth Government, and a new enquiry has been directed. Pending the result of this inquiry the present bounty act and regulations will be continued for a year from 1 July 1959. At present a bounty is payable on sulphuric acid from prescribed local materials (pyrites and lead sinter gas) and sold for delivery in Australia or used in the production of any commodity. Maximum rate of bounty is fixed at £4 ton.

The Commonwealth Tariff Board's Report on the Sulphuric Acid Bounty Act 1954 (dated 18 September 1958, but only recently issued) gives the latest information about Australia's sulphuric acid production. In its report the board recommended payment during the five years from 1 July 1959 of a bounty on sulphuric acid produced in Australia from indigenous sulphur-bearing material, and repeal of section 10 concerning limitations of profit. They also recommended bounty on sulphuric acid produced from pyrites to be payable at a composite rate as follows: (a) a fixed rate of £2 17s 6d per ton calculated on the basis of 100% acid, plus or minus; (b) amount per ton by which the cost of pyritic sulphur exceeds or falls short of the cost of imported brimstone. This amount is to be calculated by multiplying the difference in cost (into work bins) per unit of sulphur from pyrites and brimstone by the number of units of sulphur required to manufacture one ton of 100% sulphuric acid (approximately 33 units). Costs of pyritic sulphur are to be the costs effective on 18 November 1957 provided that where production from pyrites had not begun before that date or where there was any change in the source of supply, the Minister should determine the cost for purposes of the bounty.

Brimstone Price

The price of brimstone for purposes of bounty payment is to be determined by the Minister, at quarterly intervals, as at present, based on the average landed prices of imported brimstone during the previous three months.

It was recommended, too, that bounty be payable on sulphuric acid produced from lead sinter gas as follows: at the rate of 7s 6d/ton 100% acid produced plus; and at the rate of 1s 9d/ton 100% acid for each 5s or part thereof by which the landed duty-free cost of brimstone is below £20 10s/ton; and bounty to be payable on oleum produced from pyrites at the rates set out above.

Cost of Bounty. At the rates of bounty proposed the total cost would be about £A1 million a year, of which about £875,000 would relate to production from pyrites and £95,000 to production from sinter gas.

The policy of conversion of Australian sulphuric acid plants to use of indigenous materials envisaged attainment of 65% production from indigenous materials by 1956. Since 1951, when exports of brimstone were limited to counter depletion of known reserves, large sums have been spent on improvement of plant and equipment for mining, treating and transporting pyrites, for changing over acid plant to burn pyrites instead of brimstone and for erection of new plant for production of sulphuric acid from pyrites or other indigenous materials such as lead sinter gas. Percentage of production of 65% was not reached in 1956 (39.8% in 1955-56, 50.4% in 1956-57 and 50.9% in 1957-58). Nevertheless although the target has not been reached there has been a considerable increase in production from indigenous materials. During the year ended 30 June 1957, the various sulphuric acid plants in Australia used a total of 148,000 tons of brimstone and 228,000 tons of pyrites as well as large quantities of other materials (mainly lead concentrates and zinc concentrates).

Australia's sulphuric acid production is reviewed in *Chem. Engng. and Mining Rev.* (Australia), 1959, **51**, No. 10, 44).

New South Wales. Australian Fertilizers Ltd. are proposing to erect a new contact plant for treatment of indigenous sulphur-bearing materials as the first unit of additional equipment at Fort Kembla. Copper sulphide concentrates and brimstone will be used, but pyrites could be substituted for brimstone at a later date. The company already has two brimstone plants and a pyrites plant.

At Sulphide Corporation Pty. Ltd., both brimstone and pyrites are used at their Cockle Creek, near Newcastle, plant. Plans are being made for erection of a smelter on the existing works site which will draw its raw materials (mainly zinc concentrates with some lead concentrates or mixed lead-zinc concentrates) from Broken Hill. Production from smelter gas in these two plants might be about 120,000 tons acid a year, it is estimated.

Small quantities of acid are produced by DHA (Chemicals) Pty. Ltd., at Rozelle and by Government Explosives Factory at Mulwala. Oleum is produced at Mulwala.

Victoria. At their Garraville works, Commonwealth Fertilisers and Chemicals Ltd. manufacture acid from pyrites and brimstone and, to a limited extent, from spent oxide and waste acid sludge. Phosphate Co-operative Co. of Australia Ltd. and Cresco Fertilizers Ltd. operate on brimstone at Geelong and I.C.I.A.N.Z. Ltd. produce a small quantity of oleum at Deer Park. Shell Refining (Aust.) Pty. Ltd., have erected plant at its Geelong refinery for production of sulphuric acid from petroleum refinery gas. Only limited quantities of brimstone will be required to supplement H_2S obtained from the refining. Acid production began early this year. Establishing a plant at Altona to produce elemental sulphur from H_2S from petroleum refining are Standard-Vacuum Refining Co. Aust. Pty. Ltd. Production will start this year.

Queensland. Acid from brimstone and pyrites is produced by ACF and Shirleys Fertilisers Ltd., at Brisbane and their subsidiary, A.C.F. and Shirleys (North Queensland) Ltd., operates on brimstone only at Cairns. The other producer in Queensland is Mary Kathleen Uranium Ltd., who produce brimstone acid for their own use at its Mount Isa mine.

South Australia. In this state, acid plants which operated on zinc concentrates at Port Pirie, Birkenhead and Wallaroo have been closed and also a brimstone-burning plant operated by Cresco Fertilizers Ltd. at Port Lincoln (Cresco now buy from Shell Refining (Aust.) Pty. Ltd.). Acid manufacture is now carried on by: Sulphuric Acid Ltd., Port Adelaide, using pyritic concentrates supplied by Pyrites Ltd. their capacity is 100,000 tons of acid per annum; Broken Hill Associated Smelters operating on lead sinter gas at Port Pirie at a rate of 63,000 tons a year; and by Adelaide Chemical and Fertilizer Co. Ltd., a minor producer, using brimstone at Port Adelaide.

The three South Australian producers of superphosphate—Cresco Fertilizers Ltd., Adelaide Chemical and Fertilizer Co. Ltd., and Wallaroo-Mount Lyell Fertilizers Ltd., have combined to form Sulphuric Acid Ltd., and so obviated the need for separate conversion programmes. The same companies, together with Broken Hill Pty. Co. Ltd., have also formed Nairne Pyrites Ltd., to develop Gibraltar ore deposits at Brukunga, the South Australian Govern-

PRODUCTION OF H_2SO_4 IN TONS
(to nearest 100 tons)

Year	Ex-Brimstone	Ex-Pyrites	Ex-Zinc Concentrates	Ex-Spent Oxide	Ex-Other Materials	Totals	Total % from Indigenous Materials
1952-53 ...	338,200	184,900	93,600	11,200	100.0	628,000	—
	53.9%	29.8%	14.9%	1.8%	—	100.0%	46.1%
1953-54 ...	433,700	186,100	102,700	11,400	100.0	734,000	—
	59.1%	25.4%	14.0%	1.5%	—	100.0%	40.9%
1954-55 ...	531,400	190,200	101,100	12,600	Nil	835,300	—
	63.6%	22.8%	12.1%	1.5%	—	100.0%	36.4%
1955-56 ...	544,700	236,400	80,300	15,400	27,700	904,500	—
	60.2%	26.1%	8.9%	1.7%	3.1%	100.0%	39.8%
1956-57 ...	438,800	276,500	98,700	12,600	57,200	883,800	—
	49.6%	31.3%	11.2%	1.4%	6.5%	100.0%	50.4%
1957-58 ...	491,500	306,200	111,900	15,700	76,100	1,001,400	—
	49.1%	30.6%	11.2%	1.5%	7.6%	100.0%	50.9%

ment assisting in this project. The percentage of sulphuric acid made in the state from indigenous materials has risen from 45% in 1955 to 94% at the present time.

Western Australia. Principal producers, Cuming Smith and Mount Lyell Farmers Fertilizers Ltd., operate plants as follows: Bassendean—pyrites and brimstone; Fremantle—pyrites; Geraldton and Bunbury—brimstone, and Albany—brimstone. This last is operated by Albany Superphosphate Co. Pty. Ltd., wholly owned subsidiary of Cuming Smith. At Fremantle, the company is experimenting with the use of gold bearing pyrites from Kalgoorlie.

At Bayswater in this State, Cresco Fertilizers (W.A.) Ltd. have a plant which uses both brimstone and pyrites.

Tasmania. Except for special purposes Tasmania is wholly independent of brimstone.

At Risdon, Electrolytic Zinc Co. of Australasia Ltd. uses zinc concentrates for acid production.

Northern Territory. Manufacturing brimstone acid solely for their own purposes at Rum Jungle are Territory Enterprises Ltd.

Future Demand. According to the Australian Bureau of Agricultural Economics, expected demand for sulphuric acid in 1964-65 has been assessed as follows: phosphate fertilisers, 920,000 to 1 million tons; ammonium sulphate about 100,000 tons, and industrial applications about 175,000 tons. This is equal to an increase of about 4% per year between 1954-55 and 1964-65. Also according to a B.A.E. survey of superphosphate usage, the total in 1954-55 was 1,700,000 tons, of which 1,000,000 tons were used on pasture and 435,000 tons on wheat.

Requirements for 1964-65 have been assessed as between 2,600,000 tons and 2,800,000 tons. In 1956-57 (latest year for published statistics available) usage was 1,800,000 tons.

New Potash Process Gives Higher Quality Muriates

TWO muriate products—coarse and standard—are now being produced in one operation using a flotation process. The process has been developed by International Minerals and Chemical Co. at their Carlstad, N.M. plant in the U.S. Describing their work at the 136th American Chemical Society's meeting at Atlantic City, the company claim also better process efficiency (up 3.6%) lower output cost and potash with a higher H_2O content. This now averages about 0.6% more than potash made by previous I.M.C. methods and means savings in freight rates which are passed on to consumers. Reagent costs have been cut as well by 46% for starch used to inactivate clay, by 10% for the stearyl amine used in flotation.

First tried on a pilot plant, I.M.C. found that clay removal from sylvanite ore must exceed 92%, otherwise flotation of coarse particles suffers. Also, that coarse muriate must be treated with a petroleum-type oil after addition of the amine. Amine and oil coat the coarse particles, encourage air bubbles to form around them, causing them to rise to the surface of the flotation stream. And coarse particles can't be treated completely with amine and oil if too many fine particles are present. The new process was designed to send fines and coarse muriate via separate routes to be reunited at the end of the process stream. Changes in the process previously used by I.M.C. are extra desliming (clay removal) whereas previously 60% of clay was removed, 90% is removed now. This is accomplished by hydrocyclones inserted in the coarse particle circuit and an extra hydroseparator in the fire circuit. (In the old process only a classifier was used to remove clay in the coarse stream.) In the fines stream instead of two hydroseperators arranged in parallel there are these two combined with another arranged in series for extra desliming. And where only amine was used previously, oil is now employed as well.

Newly mined ore is screened to separate a -4 $+20$ mesh fraction, ultimately to go into granular production. The remaining ore is crushed and screened, pulped in brine and classified. Coarse particles flow to rod nutts where oversize particles are reduced and clay agglomerates dispersed. Then desliming operations begin.

After clay removal from the coarse and fines streams the mixture of coarse and small matter floats in a conventional rougher-cleaner system, which operation separates sodium chloride crystals and other gangue salts leaving concentrated KCl crystals.

Process brine is drawn from the concentrate, which goes to a concurrent fired drier. The drier not only dries but serves as an air classifier, separating muriate dust from larger particles. The dust fraction leaves the main system, but the rest of the muriate flows to screens where it divides into coarse and standard fractions. Some fines are left and, combined with dust, go into refined potassium chloride and agricultural grade potassium sulphate.

I.C.I. to Use S.B.A. Process for Ammonium Nitrate Granulation

Imperial Chemical Industries Ltd. and Société Belge de l'Azote et des Produits Chimiques du Marly (S.B.A.), Liege (Belgium) recently concluded an agreement whereby S.B.A. are granting I.C.I. the licence for their process for ammonium nitrate granulation.

This process is applied by S.B.A. in their own plants and moreover is used in many other units erected abroad by the S.B.A. Engineering Division for various important chemical companies.

Seed Applicator for Liquid Dressings

PLANT Protection Ltd. have evolved at their Fenhurst Research Station, the Plantector seed treater, for applying liquid or powder dressings, or a combination of both, Ceresol, a liquid seed dressing for the control of disease and wireworm, and Agrosol, the first liquid organo-mercury fungicidal dressing to be made in the U.K.

The machine and dressings have been in commercial use on a limited scale for three years, to test their reliability under a variety of conditions. They will be fully available for the spring season.

Ceresol is a liquid dressing for the control of disease and wireworm on cereal crops. It contains an organo-mercury compound plus an insecticide, and is the first dual-purpose dressing to be marketed in any country.

Agrosol is a fungicidal liquid dressing for the control of cereal diseases. It is based on the same organo-mercury compound as Ceresol and is the first liquid fungicidal dressing to be made in the U.K.

Glaxo's New Food Fights Child Malnutrition

A NEW protein food, Amama, is being marketed in Nigeria by the Glaxo organisation to combat the high death rate among children due to protein deficiency. This product, a pink powder to be added to a child's food, consists of groundnut flour to which dried yeast, milk casein, sugar, five minerals and seven vitamins have been added.

An operator releasing the bowl of blended Amama for removal from machine

Amama is manufactured by Glaxo Laboratories (Nigeria) Ltd. at Apapa.

The age group liable to protein deficiency, or kwashiorkor as it is known in many parts of the world, is from about six months to school age. Kwashiorkor can develop rapidly and is an extremely distressing disease with a high death rate.

Overseas News

MORE OLEFIN AND POLYOLEFIN PLANTS TO BE BUILT IN THE U.S.

PLANS to increase high-pressure polythene capacity are announced by Union Carbide Corporation. New plants will be built at both Seadrift and Texas City, Texas, and are scheduled for completion by mid-1961. They will add 170 million lb. of capacity at the two locations, and will increase Carbide's total high-pressure polythene capacity to about 600 million lb. a year. Reason for the decision is considered to be packaging demands for high-pressure polythene.

Phillips Chemical are to further expand ethylene capacity at their Sweeny, Texas, plant by 35 million lb. a year. This expansion will raise the plant's annual capacity to 290 million lb. when completed in the second quarter of 1960. This new project is in addition to a 75 million lb. expansion due on stream this week.

Recently Phillips Chemical reduced prices for some of their low-pressure polythene by 3 cents, to 35 cents per lb. Other U.S. producers have not followed suit.

Italian Firms Investigating In Yugoslavia

As part of a widespread movement for Italian firms to take part in industrial development in Yugoslavia Montecatini and Ansaldo plan to build a chemical fertiliser plant costing 10 milliard lire (about £5½ million).

Joint U.S.-Belgium Oil Additives Company

The formation of Amoco Fina S.A. is announced by Amoco Chemicals Corp. (U.S.) and Petrofina S.A., Brussels. The new company, which is jointly owned by Amoco Chemicals Corp. and Petrofina, is registered in Belgium.

Amoco Fina will manufacture and market additives for petroleum products in the European Common Market. Directors are Mr. J. Meeus and Mr. R. Gillerot of Petrofina, Mr. W. Claessens of Purfina, Mr. R. L. Hockley and Mr. L. L. Smith, both also directors of Amoco Chemicals Corp., and Mr. D. A. Monro, administrator of Société Civile Amoco in Paris.

Amoco Fina will start construction soon of a plant at Antwerp. The plant is scheduled to be in production early in 1961.

Joint U.S./Dutch Plants in Operation

Two new joint U.S./Dutch plants were opened in Holland recently. A large venture is the Ciago synthetic rubber factory, near Arnhem, a joint A.K.U.-B.F. Goodrich undertaking. This plant should initially produce an estimated 5,000 to 6,000 tons of special-purpose synthetic rubber annually, but output could be more than doubled without much difficulty, it is stated. About 90% of production is intended for export. The factory represents an investment of between Fls.5 million and Fls.10 million (£500,000 to £1 million).

Merck of Holland Open Factory Extension

Merck Sharp and Dohme Nederland N.V., at Haarlem, Dutch subsidiary of the American manufacturers of pharmaceutical chemicals, put into operation a Fls.3.5 million (£0.33 million) extension to their existing factory, which was founded only two years ago, and cost Fls.4 million (£0.37 million) to build.

The extension consists mainly of a chlorothiazide production plant. Manufacture of the last pharmaceutical stage of the drug was already taking place at Haarlem and exports had reached a value of Fls.6.5 million annually. Now that the chemical production of the basic material has been added the management is confident that the value of its exports, which will represent 85 to 90% of output, will reach at least Fls.13 million.

Funds for Colombian Fertiliser Plant

Credits and investments are being secured to finance the completion of the fertiliser plant at Barrancabermeja, the construction of which has been at a standstill for several months.

An internal loan of 30 m. pesos has been obtained from Colombian banks at favourable terms and these funds will cover the construction costs of buildings to house the machinery and the initial operating expenses.

California Location for Dow's West Coast Polypropylene Plant

Torrance, California, is the site chosen by Dow Chemical for the U.S. West Coast's first polypropylene plant. The site has been chosen because of raw material availability and market considerations. It is also the main location for Dow's other western plastics plants. The plant is due on stream sometime in 1961. Cost is suggested as "several million dollars."

French Uranium Plant

The new uranium plant at Malvezie, in Southern France, has been completed ahead of schedule and is due to go into production almost immediately. Constructed by two chemical companies under the direction of the French Atomic Energy Commission, it is expected to produce about 1,000 tons of uranium a year for nuclear purposes and will be operated for the French Government by the Societé d'Etudes et de Traitement de l'Uranium.

The Malvezie installation will treat uranite to produce uranium and will also recycle the uranium liquid coming from the Marcoule atomic energy plant.

America's Biggest Acetic Acid Plant

Completion of a multi-million dollar expansion of Celanese Corp. of America's acetic acid facility at Pampa, Texas, has nearly doubled its capacity, making it the largest acetic acid plant in the U.S. The plant's capacity is 240 million lb. a year for the two basic acetyl chemicals, acetic acid and acetaldehyde. Mr. Richard W. KixMiller, president of Celanese Chemical Co., described the expansion as a step in a long-range plan to diversify, upgrade and expand production of Celanese chemical products. The company, he reported, is hard pressed to fill demands of customers for acetic acid and its derivatives.

Export sales of Celanese acetic acid and its derivatives are handled by Amcel Co., Inc., who are represented in the U.K. by A. Revai and Co. (Chemicals) Ltd., London E.C.3.

Mechanical Loading at Nitrate Port

The Anglo-Lautaro Nitrate Corporation have begun the construction of mechanical loading installations for bulk nitrate at the port of Tocopilla, Chile, a project designed to speed the loading of approximately a million tons of nitrate a year and to reduce considerably the turn-round time of the nitrate ships using the port.

The project consists of six warehouses, each with a capacity of 10,000 tons, and conveyor belts from the warehouses to the ships, capable of loading 1,200 tons an hour. A joint U.S.-Chilean firm is carrying out the work, which should be finished in 18 months.

South African Anti-dumping Duties

South Africa has imposed an anti-dumping duty on insulin from Sweden. Similar duties have also been imposed on the following imports from Western Germany, Italy, Norway and Belgium: dibutyl phthalate, dioctyl phthalate, di-iso-octyl phthalate, dinonyl phthalate, didecyl phthalate, di-iso-decyl phthalate, phthalates of industrial C7-C9 alcohol.

Chlorination of Propylene to Yield Allyl Chloride

One of the conditions attached to obtaining a high yield in the chlorination of propylene to allyl chloride is the intensive and speedy mixing of pre-heated propylene with chlorine. Dr. P. Klúcousky, of the Czech petrochemical concern, Vyskumny Ústav Pre Petrochémiu Nováky, has been testing a cyclone-type

reactor at the Nováky research unit, which permits a quick mixing of two or more gases. This reactor consists of a tube into which the gaseous components are introduced by jets, the direction of the two streams corresponding to one another. A core is situated in the middle of the tube to act as carrier for the thermo-elements. The outer heating of the reactor is regulated according to the temperature registered at the core.

Klúcousky reports that the yield of allyl chloride has been measured with respect to the dimensions of the reactor and the flow of gases. The yield has corresponded to that of a commercial production unit.

Deutsche Erdoel and Rheinpreussen May Amalgamate

According to a West German report, an amalgamation between the oil, chemical and coal mining firm of Deutsche Erdoel AG (DEA) and Rheinpreussen AG, coalmining and chemical products company, is under consideration, both companies have announced.

Indian Fertiliser Projects

Production of nitrogenous fertilisers in the shape of urea with fixed nitrogen content is one of the schemes included in the Neyveli Lignite Project at Neyveli, India. Output will be 70,000 tons a year.

Mr. Lal Bahadur Shastri, Indian Union Minister for Commerce and Industry, stated in Hyderabad that the Government had decided that Andhra Pradesh should go ahead with its proposed fertiliser plant project, which is estimated to require an outlay of about £22½ million.

Dutch Sulphur Imports

Sulphur imports into the Netherlands have jumped from 2,000 tons in 1938 to 65,000 tons in 1958; they come almost entirely from Mexico and the U.S. The recent sharp rise in imports stems from the opening of a new sulphuric acid plant that uses sulphur rather than pyrites as a raw material. For this reason, imports of pyrites were down from 403,000 in 1938 to 345,000 tons in 1958. Most of it came from Cyprus, Portugal and Italy.

Production of Iodine May Stop in Italy ?

A rumour that the Italian Government intended to abolish duty on imports of iodine and to continue the stopping of production in Italy has caused alarm at Salsomaggiore, where the only Italian plant producing iodine is situated. This plant is State-controlled and it seems that the decision may have been adopted in conformity with the Common Market Treaty.

Work Begins on Israel Pipeline

Work has begun on the oil pipeline from Eilath to Haifa, which is to be the basis for the foundation of a large-scale petrochemical industry in Israel. It is being carried out by the Canadian-registered company Tri-Continental Pipelines Ltd., in which French, U.S., Swiss and Israeli interests have a share. Negotiations for the import, processing and marketing of oil are said to be proceeding between the Government organisation Delek and the British concern Paz Ltd., successor of the petrochemical installation and marketing section of the U.K. Shell Oil Co. Ltd. The pipeline will come into operation next July with an annual throughput of 1,700,000 tonnes, which will be increased to an annual rate of 2,900,000 tonnes by 1961. The capacity of the pipeline can be raised to 5,800,000 tonnes a year.

Reichhold Acquire Niagara Resin Producers

Reichhold Chemicals, Inc., have purchased Varcum Chemical Corporation, Niagara Falls, N.Y., for an undisclosed sum. Varcum maintain offices, research facilities and manufacturing operations in Niagara Falls and also have a Canadian subsidiary at Lindsay, Ont. The company manufactures a wide range of liquid, powdered and solid phenol formaldehyde resins.

Imports to Alleviate S. African Fire Loss

The fire which destroyed the factory of Poly-Resin Products Ltd. at East London, is estimated by the general manager to mean a loss of £350,000 to the company, who were the sole suppliers in Africa of synthetic resins. He said: "We are making immediate arrangements to import the necessary products from our associates in Britain, America and Germany to keep our customers supplied with the materials necessary for the manufacture of their products."

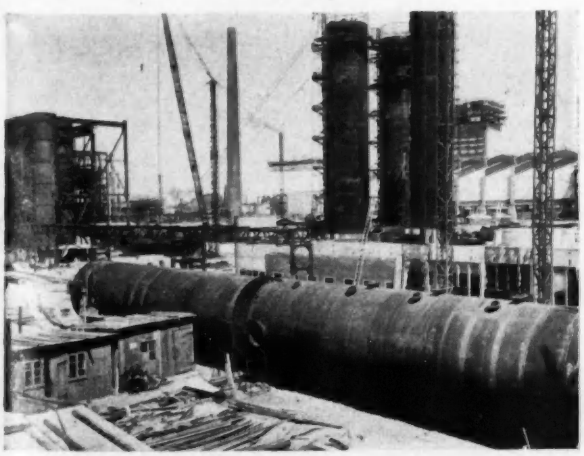
New Hamburg Coal-Chemicals Plant

AN important new coal-chemicals fertiliser plant is being built by the Hamburg gas undertaking. It is part of a coking installation which the undertaking is building on the Hohe Schaar peninsula between two tributaries of the Elbe. The coking plant, which bears the name of Kattwyk Cokery, will have an annual coal throughput of 730,00 tonnes and a coke production of 500,000 tonnes. A large range of chemicals will be produced as by-products and products *per se*. Daily chemicals output will be 67 tonnes of pressure-refined benzole, 20 tonnes of sulphuric acid, 31 tonnes of ammonium sulphate, 1.3 tonnes of phenol and 70 tonnes of tar.

An interesting feature is the laying of a plastics pipeline some 11 miles in length for the transporting of ammoniacal liquids from another of the undertaking's cokeries to the Kattwyk plant where, with the Kattwyk ammonia, it is to be processed. Crude benzole from this second plant is also to be processed at Kattwyk in addition to its own crude benzole. The ammoniacal liquors are to be separated from phenol at Kattwyk in a Phenosolvane installation that ensures the resultant waste liquor will have a phenol content of only 5 mg./l and can be fed into the surrounding waters without contravening water contamination regulations. After phenol separation, ammonia is led to a sulphate installation where it is processed to ammonium sulphate, for use as fertiliser which will be offered for export, mainly to the underdeveloped countries of the Middle East.

At the same time as the distillation of liquid ammonia, hydrogen sulphide is extracted by a selective washing process and then passed to a wet catalyst plant for conversion to sulphuric acid. This sulphuric acid will be used for the production of ammonium sulphate. Phenol extracted from the feed ammonia is expected to be sold to the plastics manufacturing industry.

Both the crude benzole produced at Kattwyk and that piped from the sister plant will be processed in a pressure-refining plant with an annual throughput of 24,000 tonnes of crude benzole. The resulting refined production will be forwarded to local oil refineries. The product may also be redistilled for the production of high purity benzole, toluol, xylol and cresol.



Combined cokery and coal-chemical plant on the Hohe Schaar peninsula under construction

PEOPLE in the news

● **Mr. Robert Nigel Bruce,** who has been deputy-chairman of the North Thames Gas Board since 1956, succeeds **Mr. W. K. Hutchison** as chairman of the South Eastern Gas Board at the beginning of next year. Mr. Hutchison is to become deputy-chairman of the Gas Council. Mr. Bruce, who is 52, was educated at Harrow and Magdalen College, Oxford. He joined the Gas Light and Coke Company in 1929 as a research chemist. In 1935 he was seconded to the South Eastern Gas Corporation and acted as technical liaison officer on the manufacture and supply side between his and associated companies. He became assistant to the general manager of the Gas Light and Coke Company in 1937. Shortly after his return from war service he was appointed controller of industrial relations for the company and, when the gas industry was nationalised, became staff controller for the North Thames Gas Board. Among his other activities he is a vice-chairman of the British Sulphate of Ammonia Federation. **Dr. James Burns,** G.M., who will become deputy chairman of the

Dr. J. Burns who will become deputy chairman of the North Thames Gas Board

North Thames Gas Board, was born in Beauly, Invernesshire and educated at the Royal Academy, Inverness, and Aberdeen University. After winning a Carnegie Fellowship he entered Cambridge University to carry out research in chemistry for three years. He joined the research department of the Gas Light and Coke Co. from Cambridge. When the industry was nationalised he became deputy chief engineer and then chief engineer of the North Thames Gas Board. He was appointed a full-time member of the board about six months ago.

● **Major W. R. Brown** has relinquished the post of joint managing director of the Power-Gas Corporation, but continues as chairman of the board. Mr. C. E. Wrangham is now sole managing director and continues as vice-chairman.

● **Mr. D. R. C. Neave** has resigned from the board of Fisons.

● **Dr. W. M. Hampton, O.B.E.,** of Chance Brothers Ltd., will deliver the 5th Chance memorial lecture under the title 'The development of furnaces for glass melting' on 9 February, 1960, in Birmingham.

● The Industrial Association of Wales and Monmouthshire and the Welsh Development Corporation have both become sponsors of the Dollar Exports Council. By agreement with both bodies, the Dollar Exports Council have invited **Sir Miles Thomas** chairman, Monsanto Chemical Co. Ltd., to represent them on the council.

● **Mr. S. L. Maguire,** M.A., LL.B., has been appointed deputy general manager of Evans Medical Ltd.'s London House, Ruislip.

● **Mr. Neil A. Campbell,** a solicitor, has joined the board of directors of Crookes Laboratories Ltd., Park Royal, London, and has been appointed chairman with **Lord Furness** as deputy chairman. Mr. Campbell succeeds **Capt. R. C. Kelly,** who died recently after being chairman for 38 years.

● **Mr. K. W. Spreckley** has been elected a director of British Oil and Cake Mills. He succeeds the late **Mr. E. D. Campbell** as area manager of the Scottish and Northern Ireland branches of the company.

● **Mr. Norman Moulson** has been appointed sales manager of British Cod Liver Oils Ltd., for whom he has been a field sales representative.

● **Dr. William H. Wheeler,** C.M.G., Ph.D., director of the Explosives Research and Development Establishment, Ministry of Supply, is resigning to join Urquhart's (1926), Ltd., combustion engineers and oil burner manufacturers, as deputy managing director. Dr. Wheeler was educated at Luton Grammar School, St. Catherine's College, Cambridge, and the Chemical Engineering Department of the Imperial College of Science. He first joined government service in November 1937 and has held many important appointments including Director of Projectile Development from 1945-50, Director of Guided Weapons Research and Development from 1950-1956 and Head of U.K. M.O.S. Staff (Australia) from 1956.

● **Dr. S. B. Coles,** technical director of the British Extracting Co., has been appointed vice-chairman in succession to Mr. Spreckley, who has left the board.

Sir Owen Wansbrough - Jones, formerly chief scientist to the Ministry of Supply, who joined the board of Albright and Wilson Ltd. on 1 October

● **Mr. Hector D. Walker,** sales director of Constructors John Brown Ltd., left London Airport on Monday, 5 October, for a visit of one week to Iran.

● **Dr. F. H. Banfield,** director of research of the British Food Manufacturing Industries Research Association, has been appointed a governor of the National College of Food Technology. The appointment was made by the Minister of Education on the nomination of the Institute of Meat.

● At the annual general meeting of the Institute of Public Supplies Officers, **Dr. F. A. Tatford,** director of contracts, U.K. Atomic Energy Authority, was elected president.

● **Mr. Hugh Harper** has resigned from his position as director and manager of sales of the Lummus Company Ltd. to take up an appointment as managing director of S.D. Plants Ltd., the British branch company of the Scientific Design Company Inc. of New York.

He will be replacing Dr. Philip E. Newman, who is also in charge of the

Soviet Chemists at Courtaulds' Labs

Mme. Natalie Abromava, a Russian expert in fibre chemistry, and Mr. Petrschchik, who is a fibre scientist, are visiting the U.K. L. to r., Mr. J. Boulton, research manager of Courtaulds Droylsden, Mr. Petrschchik, Mme. Abromava, Mrs. Boulton

European business of the Scientific Design Company with headquarters in Paris, and will continue in that capacity.

The Scientific Design Company are carrying out important contracts at Grangemouth, Wilton and South Wales.

● Sharples Centrifuges Ltd., Tower Works, Doman Road, Camberley, have appointed **Mr. Keith J. Daniells** as a chemical engineer. Mr. Daniells graduated in chemical engineering at Kings College, Newcastle, and subsequently

K. J. Daniells

submitted an M.Sc. thesis on falling film evaporators. He will be concerned mainly with the steadily increasing number of completely engineered Sharples processes and the application of a wide range of separational equipment to the chemical and food industries.

● **Mr. W. M. Bell** (Liverpool) was among technical executives from all over the U.S., Canada and Europe who attended two three-day conferences for the staff of Reichhold Chemicals Inc. at White Plains, New York, during the week 21-26 September. Those attending the conference saw new equipment at RCI's Elizabeth, N.J., plant, including a $265,000 emulsion kettle and a $5 million phthalic anhydride facility.

● Audco Annin Products Division of Audley Engineering Co. Ltd., Newport, Salop, have appointed **Mr. M. Waterson** as their North Eastern area technical sales representative, based on Billingham, Co. Durham, and Mr. K. Lee as their North Western area technical sales representative, based on Marple, Ches.

● Next year the British Pharmaceutical Conference goes to Newcastle upon Tyne where it held its first meeting in 1863. The chairman will be **Professor W. H. Linnell**, Dean of the School of Pharmacy in the University of London.

● **Mr. J. Clifford Lang**, who since 1957 has been director of construction of the Du Pont United Kingdom neoprene plant now nearing completion at Londonderry, Northern Ireland, has been appointed director of construction for the plant to be erected in Dordrecht, Holland by Du Pont de Nemours (Nederland) N.V., for the manufacture of Orlon acrylic fibre. The engineering and purchasing office for plant construction is located at The Hague.

£¾m First Stage of Glass Fibre Plant

GLASS Yarns and Deeside Fabrics Ltd., an associate company of Microcell Ltd., have embarked on a major capital expenditure programme that will expand considerably its glass fibre output.

Fibre drawing will begin in two to three months' time from a battery of furnaces now being installed in a large new factory at Camberley, Surrey.

The completion of this plant will mark the first £750,000 stage of a vast expansion programme. The plant, which will eventually be extended over an area of 250,000 sq. ft., will initially produce glass fibre, rovings and mat of the latest types.

Although this stepped-up production will meet all present requirements, the plant will have the capacity to cater for any sudden large increase in demand.

O.C.C.A. Exhibition Has 84 Exhibitors

APPLICATIONS from 84 companies and research organisations have been accepted for the 12th technical exhibition of the London section of the Oil and Colour Chemists' Association, to be held at the Royal Horticultural Society's New Hall, London S.W.1, on 15-17 March.

Sir Alexander Todd, F.R.S., chairman of the Advisory Council on Scientific Policy and Professor of Organic Chemistry at Cambridge, will perform the opening ceremony and will be the principal guest at the exhibition luncheon at the Criterion Restaurant.

Heavy Organic Chemicals Group For S.C.I.

A NEW subject group of the Society of Chemical Industry, the Heavy Organic Chemicals Group, will be inaugurated at a meeting at 14 Belgrave Square, London S.W.1, on 12 November.

The inaugural lecture will be given by Mr. D. G. Smith under the title The Production of Bulk Organic Chemicals, at 6.0 p.m.

The first officers are: chairman, Dr. R. Holroyd (a deputy chairman, I.C.I.); deputy chairman, Dr. M. A. Matthews (Chemical Industry Administration, Shell Petroleum Co. Ltd.); hon. secretary, Mr. H. P. Hodge (Esso Petroleum Co. Ltd., 50 Stratton Street, London W.1).

Co-operation of Scientists and Technologists

SPEAKING at the annual dinner of the Society of Glass Technology, the president, Mr. J. B. Murgatroyd, said the emphasis on scientific training had brought into perspective the importance of the professional society and underlined the necessity of frequent exchanges of information between scientists and technologists. This was proved by the success of the recently inaugurated policy of holding meetings where a subject was discussed in various aspects by the producers and users of products of the glass industry.

This policy was to be further advanced by the division of the Journal of Glass Technology into two parts, to be issued as separate publications, namely, Glass Technology and Physics and Chemistry of Glasses.

Chemical Firm's Part in Safety Conference

EVENTS at the annual conference of the Institution of Industrial Safety Officers at Brighton on 6-8 November will include discussion of the framework of a safety course for supervisors in which the views of a superintending inspector of factories, Mr. E. A. Clothier, will be heard in contradistinction to those of a foreman in a big chemical production unit.

A paper on training equipment and visual aids will be presented by Mr. B. L. Cornford, division safety officer, Plastics Division, I.C.I., and a paper on winning support by the spoken word will be given by Mr. Rex Roberts, education officer, Sales Region, I.C.I.

Mr. R. A. Banks, a director of I.C.I., will be one of the speakers at the conference dinner, at which the guests will include the Chief Inspector of Factories, Mr. T. W. McCullough.

DIARY DATES

MONDAY 12 OCTOBER

R.I.C. with **Ewell Tech. Faraday Soc.**—Ewell: Tech. Coll., Reigate Rd., 6.30 p.m. 'Gas phase chromatography', by Dr. A. T. James.

S.C.I.—London: 14 Belgrave Sq., S.W.1, 5.30 p.m. 'The resolution of petroleum emulsion', by Dr. Chas. M. Blair.

TUESDAY 13 OCTOBER

Inst. Chem. Eng.—Manchester: Chem. Eng. Building, Jackson St., 6.30 p.m. Research paper dealing with mass transfer, by Mr. O. E. Potter and Mr. J. M. Connolly.

R.I.C. with **Brighton Tech. Coll. Chem. Soc.**—Brighton: Tech. Coll. 'The structure of phenol-formaldehyde and allied resins', by Dr. R. F. Hunter.

S.A.C. with **Sheffield Metallurgical Assn.**—Sheffield: B.I.S.R.A., Hoyle St., 7 p.m. 'Coulometry in the analysis of metals', by Dr. G. Mattock; 'High-frequency titration', by Dr. E. S. Lane.

S.C.I.—London: 14 Belgrave Sq., S.W.1. 'Engineering aspects of recent research projects in the preservation of fish', by Mr. G. C. Eddie and Mr. S. Forbes Pearson.

WEDNESDAY 14 OCTOBER

Inst. Fuel—Manchester: Engineers' Club, Albert Sq., 6.30 p.m. 'Calcined magnesite as a water-treatment chemical', by Mr. W. F. Gerrard.

Inst. Physics—Newcastle on Tyne: King's College, 6.15 p.m. 'The effects of irradiation on reactor materials', by Dr. H. M. Finniston.

S.A.C.—Coventry: Tech. Coll., The Butts, 7 p.m. 'The analytical chemistry of tantalum and niobium' by Mr. A. R. Powell, F.R.S.

S.C.I.—London: 14 Belgrave Sq., S.W.1, 6 p.m. 'Fretting corrosion', by Dr. K. H. R. Wright.

THURSDAY 15 OCTOBER

C.S.—London: Burlington House, W.1, 7.30 p.m. Niels Bjerrum memorial lecture, by Prof. E. A. Guggenheim; preceded by presentation of Dexter Award to Prof. J. Read.

S.C.I. with **Iron and Steel Inst.**—London: 14 Belgrave Sq., S.W.1, 2 p.m. Discussion of sixth report of the Corrosion Committee.

Soc. Instr. Tech.—Liverpool: M.A.N.W.E.B. Industrial Dev. Centre, Paradise St., 7.15 p.m. 'pH'.

FRIDAY 16 OCTOBER

Plastics Inst.—Birmingham: James Watt Memorial Inst., Gt. Charles St., 6.30 p.m. 'Dough moulding compounds', by Dr. N. A. Cutler.

R.I.C.—London: St. Ermin's Hotel, Caxton St., S.W.1, 7.0 for 7.30 p.m. Annual dinner and dance.

S.C.I.—London: Westminster Medical School, 17 Horseferry Rd., S.W.1, 6.30 p.m. 'The chemistry and biochemistry of the nucleic acids', by Prof. J. N. Davidson (Glasgow).

Soc. Dyers and Colourists—Manchester: Coll. Science and Tech., 7 p.m. 'The mechanism of dyeing with Procion dyes', by Mr. H. M. Sumner.

SATURDAY 17 OCTOBER

B.A.C.—Crewe: Crewe Arms, 2 p.m. Joint meeting with heads of chemistry departments of technical colleges to consider formation of Institute of Chemical Technlogy.

Cartridges and Candles

Menrow multi-purpose treatment units are equipped with filter cartridge units or candle units, according to the duties they are called upon to perform. Where cartridge units are used, all surfaces coming into contact with the liquids being filtered are coated with Araldite 985E surface coating resin, to prevent formation of metallic salts and consequent contamination. In the candle sets, the dehydration candles are also coated with Araldite which is highly repellent to water and therefore assists separation. The oil passes through the coated candles while the water remains on the surface. Araldite epoxy resin coatings are extremely tough and flexible, unaffected by moisture and chemical attack, and provide full protection against abrasion and corrosion.

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Commercial News

- **B.B.G. Merger Will Provide Advisory Service**
- **Glaxo Pay More on Higher Profits**
- **Hoechst Report Record Half-year Sales**
- **Continued Growth in Grace Chemical Profits**

Allen and Hanburys

Allen and Hanburys Ltd., a subsidiary of Glaxo Laboratories Ltd., have declared a dividend of 30% for the year ended 30 June 1959. This compares with 17½% for the previous year. Group net profit was £339,769 (£201,723) after tax of £314,827 (£236,389).

Ashe Chemical

Ashe Chemical Ltd. have declared an interim dividend of 5% (same).

Bush Beach and Segner Bayley

Three old established companies, Bush Beach and Gent Ltd., Frank Segner and Co. Ltd. and F. S. Bayley Clanahan and Co. Ltd., have merged to form one company under the title of Bush Beach and Segner Bayley Ltd. The new business will operate not only as a supplier of heavy, fine and pharmaceutical chemicals, but also as a technical advisory organisation. Directors are: Mr. D. A. Gates, chairman and managing director, Mr. W. E. Powell, Mr. W. C. Wiggins and Mr. J. F. A. Segner, executive directors, and Miss E. M. Mason, non-executive director. Mr. L. B. Sandeman is secretary. Mr. Gates was the former chairman and managing director of Bush Beach and Gent Ltd., and associated companies. Mr. A. G. Spicer and Mr. W. E. Glasspool have been appointed as divisional managers for the new company, with Mr. D. Kellett as technical manager (leather chemicals) and Mr. H. C. Rosen as technical manager (machinery).

The merger will simplify administration and the head office will be at Marlowe House, Lloyd's Avenue, London E.C.3, with a Northern sales office at St. James' House, Brazennose Street, Manchester 2. A new branch sales office has been opened at 61 King Street, Leicester.

O. and M. Kleemann

Plastics material manufacturers, O. and M. Kleemann, are paying an interim dividend of 15% on the £333,957 ordinary shares in respect of 1959. In the previous year, an interim of 12½% was followed by a final of 7½%, plus a special interim of 10% on £288,903 capital.

Glaxo

Glaxo Laboratories Ltd. with a final dividend of 8½% are paying a total of 14% on capital increased by a one-for-two scrip issue for the year to 30 June 1959. This represents a rise of 2½% over the previous year's 11½% equivalent total.

After tax of £2,858,000 against £3,148,000, group profits increased from £2,610,566 to £3,017,796. The proportion of profits attributable to outside holders is £54,000 (£61,696). Group profits include revenue of previous years of £108,000 (£136,212). The charge for tax is after crediting £112,000 overprovision last year.

The board propose to place to general capital reserve, including obsolescence and replacement, £500,000 (£1,500,000), to general revenue reserve £500,000 (nil) and to future research and development £600,000 (nil).

Hoechst A.G.

Farbwerke Hoechst AG, Frankfurt-on-Main, state that turnover in the first half of this year was a record. It was well above the sum of DM.1,890 million (about £157,500,000) achieved in the first six months of last year. Exports have remained at the same percentage of total sales over the period—31%. The company looks forward to a 'satisfactory' dividend payment on capital which has been raised by DM.100 million, or about £8,340,000, to a total of DM.562 million (about £46,835,000). Last year's dividend was 14%, an increase of 3%.

W. R. Grace and Co.

Net earnings per share of $1.51 for the first half of 1959 are reported by W. R. Grace and Co., New York, U.S., compared with $0.85 in the same period of 1958. Total earnings per share for the six month period amounted to $1.73 this year against $1.06 in 1958. Continued growth in chemical profits is the major cause of the increased earnings, with substantially better results from South American operations also contributing.

Company net income was $7,247,000 as compared with $4,219,000 for first six months of 1958, and sales and operating revenues were $236,675,000 as compared with $220,248,000.

Completion of a new plant at Owensboro, Kentucky, has provided additional capacity for battery separators and various synthetic rubbers and polymers, and new facilities installed at Memphis have expanded Grace's urea output. The new Hatco Chemical Division is a leading producer of esters, used in the manufacture of lubricants for jet engines as well as in the processing of vinyl resins and synthetic rubbers.

Sales of high density polythene were at a much higher rate than in 1958, and that results have benefited accordingly although the break-even level has not yet been reached.

NEW COMPANIES

LIQUINURE SALES LTD. Capital £100. To acquire the business of manufacturers of and dealers in liquid fertilisers, carried on under the registered trade mark 'Liquinure' and to acquire the said trade mark, etc. Solicitor: A. P. W. Gower White, Harvest House, Felixstowe.

SET CHEMICALS LTD. Capital £100. To carry on the business of manufacturers of and dealers in plastics, cellulose, regenerated cellulose, metallic foil in all forms, and plastics in all forms, reflecting chemicals, etc. Directors: B. Clayton and P. Givertz. Solicitors: Conway and Conway. Reg. office: 4 Broad Street Place, E.C.2.

Market Reports

ACTIVE TRADING IN MOST SECTORS

LONDON Active trading conditions have been reported from most sections of the industrial chemicals market, with good quantities going into consumption against contracts. The recent improvement in the demand for textile chemicals has been maintained and there has been a good call from both the plastics and rubber industries.

A renewed interest in fertilisers has been noted.

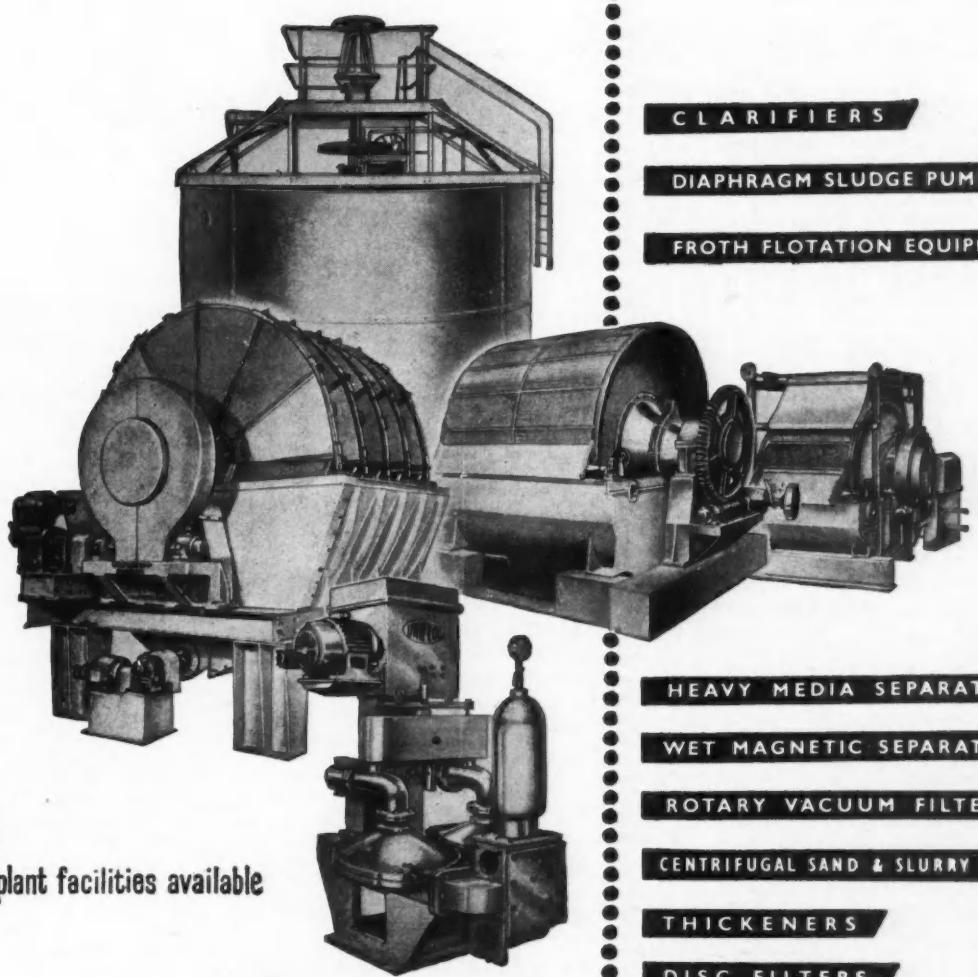
Prices generally are unchanged at recent levels, but zinc oxide prices are again dearer with the red seal quoted at £101 per ton from 5 October 1959.

The coal-tar products are moving steadily with pitch and creosote oil in good request on home and export account.

MANCHESTER A well-sustained demand for most of the leading lines has been reported for heavy chemical products. There is room for improvement in the takings of the textile and allied trades, but other industrial outlets are specifying for regular deliveries under contracts and additional business on home trade account has been fair. The shipping movement is also reasonably satisfactory in most sections. Market values generally are steady. Among the tar products, refined tar, creosote oil, and cresylic and carbolic acids are in demand.

SCOTLAND Market conditions have remained steady during most of the past week and from a cross-section of industry the volume of demands were well maintained. Although the bulk of these are still pertaining to immediate requirements, demands against contracts are still at reasonable levels. The price position remains steady. There is still a steady flow of inquiries from overseas with a satisfactory volume of resultant business.

Plant for wet material handling



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NEW PATENTS

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Specifications filed in connection with the acceptances in the following list will be open to public inspection on the dates shown. Opposition to the grant of a patent on any of the applications listed may be lodged by filing patents form 12 at any time within the prescribed period.

ACCEPTANCES

Open to public inspection 18 November

Purification of acetylene. Union Carbide Corp. **823 895**

Detergent compositions and salts used therein. Hedley & Co. Ltd., T. **823 653**

Recovering naphthalenes from hydrocarbon mixtures. Universal Oil Products Co. **823 902**

Dehydrogenation of hydrocarbons. Houdry Process Corp. [Addition to 794 089.] **823 626**

Penicillin-sulphonamide tablets. Froost & Co., C. E. **823 914**

Distillation apparatus. Zeiss-Stiftung, C. [trading as Jenaer Glaswerk Schott & Gen.] **823 915**

Therapeutic tetracycline compositions. Bristol Laboratories Inc. **823 639**

Alicyclic tetracarboxylic acids and their derivatives. Du Pont de Nemours & Co., E. I. **823 840**

Open to public inspection 25 November

Halogenated organic compounds. Haszeldine, R. N. [Cognate application 15 157.] **824 229**

Synthesis of polysaccharides. National Research Development Corp. **824 161**

Aminotriazole polymers. Geigy Co. Ltd. **824 163**

Manufacture of copolymers of epoxide resin esters. Berger & Sons Ltd., L. [Cognate application 32 167.] **824 103**

Synthetic lubricants. British Petroleum Co. Ltd., Pethrick, S. R., and Sparke, M. B. **824 249**

Thermosetting resinous condensation products. Catalin Ltd. [Cognate application 16 083.] **824 251**

Polymerisation of ethylene. Imperial Chemical Industries Ltd. **824 118**

Electroplating titanium and titanium alloys. Napier & Son Ltd., D. **824 253**

Halogenated organic compounds and derivatives thereof. Haszeldine, R. N. [Divided out of 824 229.] **824 230**

Imparting antistatic and other properties to fibres or other articles containing acrylonitrile polymers. Chemstrand Corp. **824 168**

Fibres and other shaped articles of polyacrylonitrile. Stockholms Superfosfat Fabriks AB. **824 225**

Resin compositions capable of being hardened and a process of preparing same. Farbwerke Hoechst AG. **824 261**

Graft polymers. Kodak Ltd. (Eastman Kodak Co.) **824 763**

Benzene monoazo naphthylamine dyestuffs and the manufacture. Ciba Ltd. **824 171**

Titration of solutions and like purposes. Dubois, J. E. **824 266**

Process for dyeing fibrous material of highly polymerised aromatic polyesters. Farbwerke Hoechst AG. **824 769**

Recovery of complexing agents from spent solutions. Dow Chemical Co. **824 275**

Strengthening agents. Sonnichsen, H. M., and Giroux, D. J. **824 276**

Purifying polymers. Phillips Petroleum Co. **824 278**

Monoazo-dyestuffs of the benzene-azo-benzene series and process for their manufacture. Ciba Ltd. **824 280**

Polythioureas and process for their manufacture. Ciba Ltd. **824 281**

Reactions involving Grignard reagents. Metal & Thermit Corp. **824 175**

Cupriferous disazo-dyestuffs derived from 4:4'-diaminodiphenyl and process for their manufacture. Ciba Ltd. **824 284**

Latex compositions and method of preparation thereof. Goodrich Co., B. F. **824 286**

Oxidation of copolymers of conjugated dienes. Esso Research & Engineering Co. **824 287**

Starch adhesives and method of preparation. Koppers Co. Inc. **824 108**

Halogen-allopregnanes and process for their manufacture and conversion into the corresponding dehydrohalogenation products. Ciba Ltd. **824 109**

Stabilised hyaluronidase. Ortho Pharmaceutical Corp. **824 290**

Combined filter-distillation apparatus. Constructiewerkhuizen E. D'Hooge PVBA. **824 291**

Preparation of asymmetrical sisphenols. Abbey, A. (Dow Chemical Co.) **824 110**

Production of nitrogen-containing heterocyclic carboxylic acids. Mid-Century Corp. **824 293**

Separation of mixtures in the presence of a carrier gas. Badische Anilin- & Soda-Fabrik AG. **824 297**

Metal complexes of dyestuffs of the benzene-azo-thionaphthene series. Badische Anilin- & Soda-Fabrik AG. **824 300**

Epoxy resin compositions. British Resin Products Ltd. **824 302**

Alkylation of hydrocarbons. Kellogg Co., M. W. **824 181**

Preparation of sodium bicarbonate. Diamond Alkali Co. **824 103**

Maleic anhydride. California Spray-Chemical Corp. **824 182**

Gas-producing compositions. Imperial Chemical Industries Ltd. **824 112**

Ammonium nitrate gas-producing compositions. Imperial Chemical Industries Ltd. **824 183**

Treatment of liquids such as the effluent from a plating plant. British Thomson-Houston Co. Ltd. **824 081**

Polymeric materials. Kodak Ltd. **824 308**

Production of polyhydric alcohols. National Research Council. **824 184**

Alkaloid and process for manufacturing same. Ciba Ltd. **824 311**

Oxidation of organic compounds. Imperial Chemical Industries Ltd. [Cognate application 4 366.] **824 116**

Ethylene polymerisation. Imperial Chemical Industries Ltd. **824 312**

Production of granular, non-dusting sodium metasilicate. Pennsylvania Salt Manufacturing Co. **824 188**

Organo-silicon peroxides and process of producing same. Kali-Chemie AG. **824 315**

Semi-continuous fused halide salt bath electrolytic process for production of high melting point reactive metals. Union Carbide Corp. **824 316**

Bismuth telluride. General Electric Co. Ltd. **824 189**

Production of anion-exchanging membranes. Farbenfabriken Bayer AG. **824 191**

Production of polyethylene terephthalate. Chemstrand Corp. **824 321**

Producing Δ-3, 4-thiazolines. Leuna-Werke W. Ulbricht Veb. **824 113**

Polyazo dyestuffs containing triazole rings and their use. Geigy AG., J. R. **824 327**

Production of polymers. Union Carbide & Carbon Corp. **824 193**

Furnace for production of unsaturated hydrocarbons such as acetylene by the partial combustion of more saturated hydrocarbons. Soc. Belge de L'Azote et des Produits Chimiques du Marly. **824 328**

Metal-ceramic materials. Morgan Crucible Co. Ltd. **824 124**

Polyacrylonitrile textile material. British Nylon Spinners Ltd. **824 125**

Preparation of metallic hydrocarbonyls. Esso Research & Engineering Co. **824 331**

Production of polymerisation products from olefinically unsaturated hydrogen. Badische Anilin- & Soda-Fabric AG. **824 195**

Compositions comprising reaction products of methylol-aminotriazine allyl ethers with α:β-unsaturated compounds and capable of drying at room temperature. Ciba Ltd. **824 335**

Polyvinyl resin floor and wall covering compositions. Hardman & Holden Ltd., and Ayers, J. W. **824 339**

Gastropod combating compositions. Farbenfabriken Bayer AG. **824 345**

Preparing steroid compounds. Merck & Co. Inc. **824 348**

Manufacture of a diamine. Ciba Ltd. **824 350**

Steroids of the $\Delta^{1,4}$-pregnadiene series and preparation of $\Delta^{1,4}$-pregnadienes. American Cyanamid Co. **824 351**

Process for producing petroleum resins. Esso Research & Engineering Co. **824 129**

Heat-exchanger for an evaporator. Emhart Manufacturing Co. **824 354**

Progressive burning, moulded nitrocellulose gun powder. Koninklijke Nederlandsche Springstoffenfabrieken N.V. **824 130**

Polymerisation of olefins. Ruhrchemie AG. **824 198**

Process for preparing hydrazinium salts. Ohio State University Research Foundation. **824 357**

Mycobacteriostatic compositions. Monsanto Chemicals Ltd. **824 196**

Process for manufacture of a cupric oxychloride suspension. Cupra Soc. des Produits Chimiques SA., and Mangold, P. **824 359**

Refining petroleum hydrocarbons. British Petroleum Co. Ltd., Northcott, R. P., and Lester, R. **824 360**

Polyacrylonitrile solutions. Courtaulds Ltd. [Addition to 796 294.] **824 361**

Purifying chlorinated heterocyclic nitrogen compounds. Purex Corp. **824 199**

Purification of terephthalic acid. Imperial Chemical Industries Ltd. [Cognate application 13842.] **824 367**

High impact polymerised vinyl-aromatic compounds. Styrene Products Ltd. **824 368**

Polymerisation of olefins. Imperial Chemical Industries Ltd. **824 369**

Process and catalyst for polymerisation of polymerisable hydrocarbons. Phillips Petroleum Co. **824 374**

Gas/liquid contacting means. Distillers Co. Ltd., and Activated Sludge Ltd. **824 376**

Vinyl chloride polymer compositions and mixtures containing them. Imperial Chemical Industries Ltd. **824 200**

Polymeric materials comprising low pressure polyolefins. Petrochemicals Ltd. **824 289**

Polymerisation of butadiene. Newby, H. (Chemische Werke Hüls AG.) **824 201**

Manufacture of epoxy resins. Bataafsche Petroleum Maatschappij NV., DE. **824 384**

Dimerisation of olefins. Imperial Chemical Industries Ltd. **824 002**

Preparation of polyethylene. Metal hydrides Inc. **824 003**

Method for desulphurisation of pig iron and steel. Decker, A. **824 394**

Extraction of thorium from aqueous solution. U.K. Atomic Energy Authority. **824 396**

Pharmaceutical compositions containing 1-methyl-6-nitro-4-quinolene-3-carboxylic acid. Imperial Chemical Industries Ltd. **824 011**

Preparation of aromatic and aromatic heterocyclic di- and poly-basic carboxylic acids and their salts and other derivatives. Henkel & Cie GmbH. **824 205**

Dilactams and polyamides prepared therefrom. Badische Anilin- & Soda-Fabrik AG. **824 207**

Oxidation process. California Research Corp. **824 024**

Carrying out gas reactions. Newby, H. (Chemische Werke Hüls AG.) **824 044**

Production of cyclic alcohols and ketones. Badische Anilin- & Soda-Fabrik AG. **824 046**

Coating non-absorbent solid particles with a thermosetting resin. Borden Co. **824 048**

N-alkyl and N-alkenyl derivatives of 3-azo-bicyclo [3-3-1] nonane. Rossi, S. **824 140**

Water-soluble iodine polymer complexes. General Aniline & Film Corp. **824 215**

Refining of lead. British Oxygen Co. **824 216**

Preparation of heavy metal-diamine complexes. Armour & Co. **824 051**

Production of sulphonyl ureas. Cilag Ltd. **824 218**

Production of benzene. British Petroleum Co. Ltd., Moy, J. A. E., White, P. T., and Yeo, A. A. **824 061**

Synthesis of sulphur tetrafluoride. Du Pont de Nemours & Co., E. I. **824 142**

Process for carboxylation of phenols. Monsanto Chemical Co. **824 144**

Desalting of solutions containing electrolytes. Permutit Co. **824 220**

Aliphatic tricarboxylic acid. Olin Mathieson Chemical Corp. **824 066**

Method of and apparatus for cooling granular material. Metallgesellschaft AG., and Schenk Maschinenfabrik GmbH., C. **824 074**

Yohimbine derivatives and their preparation. Ciba Ltd. **824 097**

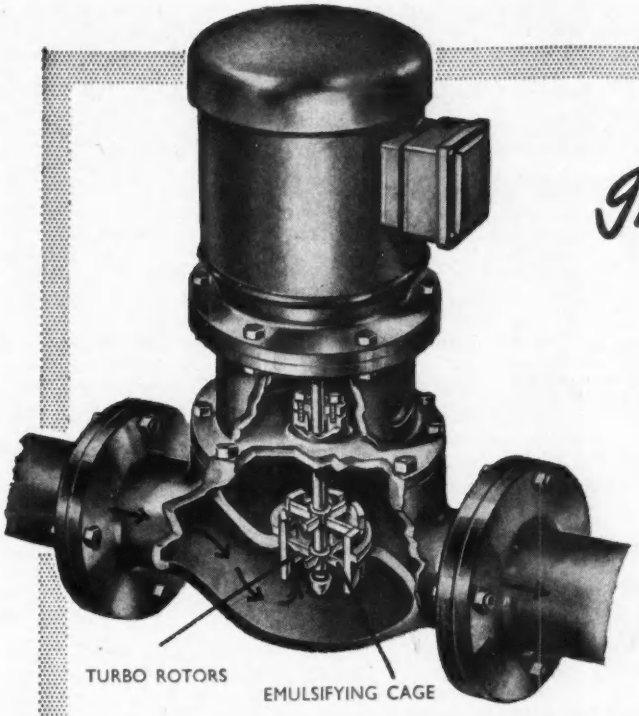
Δ^{16}-16-carbalkoxy-3-epiallo-yohimbenes. Ciba Ltd. **824 098**

Alloyed flocks from metal carbonyls and halides. General Aniline & Film Corp. **824 147**

Secondary amines and preparation thereof. Rohm & Haas Co. **824 149**

Steroid extraction. Upjohn Co. **824 151**

Process for production of unsaturated hydrocarbons. Deutsche Erdoel-AG. **824 157**



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Instead of mixing large volumes of liquids in a vessel, with consequently high power consumption, it is now possible to mix continuously IN THE PIPELINE with the Thrumix Continuous Mixer.
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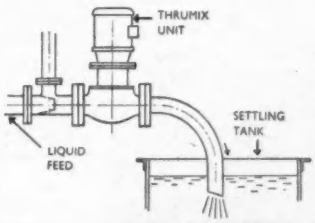

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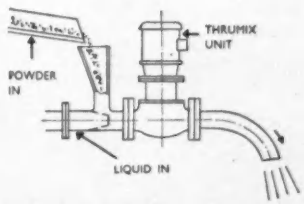

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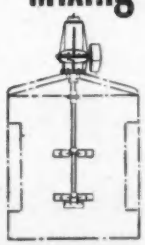

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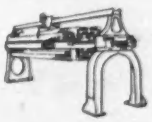

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TRADE NOTES

Plastics in Chemical Industry

The increasing use of synthetic resins and plastics in the chemical industry is described in an illustrated publication 'Synthetic Resins and Plastics in the Chemical Industry', issued by the Distillers Plastics Group, Devonshire House, Piccadilly, London W.1.

The booklet illustrates a wide range of applications in each of these fields and indicates the special properties possessed by the different types of plastics materials.

Gas Control

'Control of Flame Characteristics by Wobbe-Index Value' is the title of a leaflet written by K. A. Steele, A.M.I.Mech.E., of the Contracts Department, George Kent Ltd., Luton, Bedfordshire, and published by the company.

The operation of a gas-grid scheme may cause variations in the characteristics of the gas supplied. The article deals with ways of regulating the characteristics in order to obtain a specified performance, by controlling the incoming gas to a set Wobbe-index value.

Insecticides for U.S.

H. E. Helman and Co. (Insecticides) Ltd., 10-22 Bank Street, Gravesend, Kent, manufacturers of Spray-Mite, Warble-Mite, Firm-Foot, Hel-Mag and Ly-Cene, have concluded arrangements for the distribution of these products throughout the U.S., Canada and Mexico, through Haver-Lockhart Laboratories, Cutter Laboratories of Berkeley and the Corn King Co. Inc. of Cedar Rapids, Iowa.

Bigger Factory for Aerox

As a result of increasing demand for aeration, filtration and fluidising equipment, Aerox Ltd. have outgrown their premises at Crawley and have acquired a much larger factory for their engineering section.

The new factory address is Chalford, Stroud, Gloucestershire, and there they will manufacture all forms of equipment incorporating porous ceramic filter elements. These elements will continue to be made at the main Hillington (Glasgow) plant.

Electrode Prices Reduced

From 1 October the price of all English Electric mild-steel electrodes are reduced by 5%. This reduction covers twelve types of electrode.

Catalogue of Chemicals

A new publication from the General Chemicals Dept. of Albright and Wilson (Mfg.) Ltd., 1 Knightsbridge Green, London S.W.1, lists close on 400 regular products.

These general and fine chemicals are detailed in alphabetical order; a brief description of physical form and the nature of the packs the products are available in is useful additional information. Entries range from aluminium chlorhydrate to zinc derivatives.

Anti-Corrosion Finish

A leaflet issued by the Metal Finishing Division of the Pyrene Co. Ltd., Great West Road, Brentford, Middlesex, gives information about Endurion, a simple immersion process which imparts to zinc phosphate Parkerized surfaces of ferrous metals a dense, fine-textured, corrosion-resistant finish with some improvement in wear resistance accompanied by almost negligible dimensional build-up. Endurion is a trade mark of B.B. Chemical Co. Ltd., Leicester.

Change of Addresses

Administrative and technical departments of Film Cooling Towers (1925) Ltd moved to new premises on 5 October. This move has been necessitated owing to the increasing demand for water cooling towers designed on their special film flow principles.

Their new address is Chancery House, Parkshot, Richmond. Richmond 6494/8.

Mandoval Ltd., importers of crude vermiculite, moved on 3 October to new offices at: Barrington House, 59 Gresham Street, London E.C.2. Metropolitan 9101.

Chas. H. Windschuegl Ltd., a member of the Amber Group of Companies left their City address on 30 September and established offices at the group headquarters, 11a Albemarle Street, London W.1 (Mayfair 6161), where they will be able to make use of all facilities available to members of the group.

Classified Advertisements

CLASSIFIED RATES: All sections 5d. per word. Minimum 8/-. Three or more insertions 4d. per word. Box Number 2/- extra. Up to 10 a.m. Tuesday for insertion same week.
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COMPANY MEETINGS AND REPORTS: £12.12.0 per column. Three column measure (approximately 360 words).

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INTERESTED IN AMERICAN MARKETS?

American chemical manufacturer wishes to form a joint company in the United States (and in Europe) with a European manufacturer having specialised products, process know-how, or patents in the chemical and allied fields. **Pinheiro, Buckeridge & Co., Solicitors, 32 Savile Row, London, W.1.**

EDUCATIONAL

CHELSEA COLLEGE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF CHEMISTRY
ANALYTICAL METHODS

A second series of postgraduate lectures on more recent analytical techniques will be held during the Autumn term on Tuesdays at 7.15 p.m., commencing on October 20, 1959. The topics will include mass spectrometry, non-aqueous solvents, activation analysis, complexometric titrations, EMR and microwave spectroscopy, ion exchange, X-ray fluorescence and gas chromatography. A leaflet giving full details, and an application form may be obtained from the Head of the Chemistry Department, Chelsea College of Science and Technology, Manresa Road, London, S.W.3.

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AUTOCLAVE, Steam Jacketted 150 lb., 6 ft. 0 in. by 3 ft. 3 in. diameter, quick closing door, **VACUUM OVEN** 7 ft. 3 in. by 5 ft. 3 in., eleven steam heated shelves 7 ft. by 3 ft. 8 in., with condensor and vacuum pump.
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Brand New **COCHRAN** Vertical and **ECONOMIC** Self-contained **STEAM BOILERS** in stock, also all sizes reconditioned and guaranteed. List on request.
STAINLESS STEEL TANKS, PANS, CONDENSERS, PLATES, VALVES AND COCKS. Very wide selection.
80 gall. S.S. Jacketed Mining Pan, tilting type.
Ten new enamel-lined **ENCLOSED TANKS,** 150/1,000 galls.
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S.S. Mixing Vats, 280 gal. each A.C. (2).
S.S. Tanks, 4 ft. diam., by 3 ft. deep, 200 galls.(3).
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Several s.s. **COILS** from 2 ft. to 7 ft. dia.
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Enquiries invited.

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The new College will come into use in October this year, and the candidate appointed will be expected to assist with the development of the courses there. New laboratories will provide facilities for original work.

Salary scale: £813 15s. by £26 5s. to £1,207 10s., plus an appropriate increase from 1st October, 1959 in accordance with the recent Burnham Committee Award. The starting salary will be dependent on qualifications and experience.

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Chemical Age
154 Fleet Street, London, E.C.4
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